

United States
Nuclear Waste Technical Review Board (NWTRB)

Transcript

International Workshop on Siting of Radioactive Waste Facilities

Tuesday
August 29, 2023

PUBLIC MEETING
In-Person and Virtual

Idaho Falls, Idaho

NWTRB BOARD MEMBERS IN-PERSON

Nathan Siu, Ph.D., Chair
Ronald Ballinger, Sc.D.
Steven M. Becker, Ph.D.
Allen G. Croff, M.B.A
Tissa Illangasekare, Ph.D., P.E.
Scott Tyler, Ph.D., Deputy Chair
Brian Woods, Ph.D.

NWTRB BOARD MEMBERS VIRTUAL

Kenneth Lee Peddicord, Ph.D., P.E.
Paul J. Turinsky, Ph.D.

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Dan Ogg

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Neysa Slater-Chandler

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Yoonjo Lee
Bret Leslie
Chandrika Manepally
Roberto Pabalan

NWTRB ADMINISTRATION STAFF MEMBERS IN-PERSON

Davonya Barnes

1 SIU: Got a great clock's counting down here to the seconds.

2 Okay, it's eight o'clock, so I think we should get started.

3 Bret, are we ready?

4

5 LESLIE: Mike, are we ready?

6

7 SIU: Okay, thank you. Good morning, everybody, and to our
8 international participants, and good morning, good afternoon,
9 good evening, perhaps. Welcome to our US Nuclear Waste Technical
10 Review Board's hybrid international Workshop on the Siting of
11 Radioactive Waste Management Facilities. I'm Nathan Siu. I'm the
12 Chair of the Board. And I will give you first a brief overview
13 of the Board, we'll introduce the Board members, and then we'll
14 talk a little bit about the Board, who we are, what we do, and
15 this is for folks who are unfamiliar with us, and then I'll talk
16 a bit about the meeting itself. And of course, Dr. Bret Leslie
17 will fill you in on a little bit more details.

18

19 Okay, let's start with introducing the members of the Board. As
20 I said, I'm Nathan Siu. I'm retired from the US Nuclear
21 Regulatory Commission, and a Special Member of the graduate
22 faculty at the University of Maryland right now, the house. And

23 I'll ask the Board members who are present to raise their hands
24 as I introduce them. We have two members who unfortunately are
25 unable to participate in this meeting. Currently, now we have
26 nine members on the Board, our full complement's 11.

27

28 Okay, so we'll start with Ron Ballinger. Ron? Ron is a Professor
29 Emeritus of Nuclear Science and Engineering at the Massachusetts
30 Institute of Technology.

31

32 Steve Becker is Professor of Community and Environmental Health
33 in the College of Health Sciences at Old, Old Dominion
34 University in Virginia.

35

36 Allen Croff is a nuclear engineer and adjunct professor at the
37 Department of Civil and Environmental Engineering at Vanderbilt
38 University.

39

40 Tissa Illangasekare, sorry Tissa, common, is the Amax Endowed
41 Distinguished Chair of Civil and Environmental Engineering at
42 the Colorado School of Mines.

43

44 Scott Tyler is a Professor Emeritus in the Department of
45 Geological Sciences and Engineering at the University of Nevada,
46 Reno.

47

48 And Brian Woods is the School Head and Professor at the School
49 of Nuclear Science and Engineering at Oregon State University.

50

51 Off camera, or participating today, Dr. Paul Turinsky, who is a
52 Professor Emeritus of Nuclear Engineering at North Carolina
53 State University.

54

55 And Professor Lee Peddicord is a Professor Emeritus of Nuclear
56 Engineering at Texas A&M University.

57

58 So again, as I said, we have nine Board members, not a full
59 complement of 11. And our other positions are, we're trying to
60 fill them. Information on our backgrounds can be downloaded from
61 the Board's website. All right, we have free-wheeling thinkers
62 here on the Board. And of course they can, can express opinions,
63 implied, or even perhaps direct, but although discussion is
64 going to be very important to this workshop and tomorrow's
65 meeting, I want to make sure everybody understands that the

66 views expressed by the Board members at this meeting, at this
67 workshop, are their own and not necessarily the Board's. Our
68 official positions can be found in our reports and letters,
69 which are available on the Board's website.

70

71 Okay. So, this was who we are. And now let's talk about the
72 Board. We are an independent federal agency in the Executive
73 Branch. We are not a part of the Department of Energy or any
74 other federal department or agency. The Board was created in
75 the, by the 1987 Amendments to the Nuclear Waste Policy Act to
76 perform objective, ongoing evaluations of the technical and
77 scientific validity of DOE activities related to the management
78 and disposal of spent nuclear fuel and high-level waste.

79

80 Board members are appointed by the President from a list of
81 nominees provided by the National Academy of Sciences.

82

83 We provide objective, technical, and scientific information on a
84 wide range of issues related to the management and disposal of
85 spent nuclear fuel and high-level radioactive waste that will be
86 useful to policymakers in Congress and the Administration. For
87 example, the Board prioritize... provides technical and scientific

88 comments in the letters or reports to DOE following our public
89 meetings and workshops, including of course, this one. At this
90 time, all this information can be found on the Board's website,
91 www.nwtrb.gov. Along with other, we do have Board
92 correspondence, reports, testimony and meeting materials also on
93 that website, and archived webcasts of recent public meetings.
94 If you'd like to know more about the Board, a two-page document
95 summarizing the Board's mission and presenting a... sorry... a list
96 of the Board members can be found on the Board's website. And we
97 also have copies of the Board's mission and some recent Board
98 reports, documents outside the room, as you've seen. We have
99 lots and lots of paper.

100

101 Okay, so, covered all this. Let's talk about the workshop. The
102 workshop agenda and presentations have been posted on the
103 Board's website and can be downloaded. We will have a public
104 comment portion at 4:45 PM, Mountain Time. That's going to be
105 very important. Those attending the workshop in-person and
106 wanting to provide oral comments are encouraged to sign the
107 public document... public comment register at the check in table
108 just outside. Oral comments, oral commenters will be taken in
109 the order in which they signed in. Depending on the number of

110 those wishing to speak, a time limit might be set. But we don't
111 know yet how many, because we don't know the full list. When
112 making comment during the public comment period, please use the
113 microphone that's available to front of the seating area. Please
114 state your name, affiliation, so that you'll be identified
115 correctly in the workshop transcript.

116

117 And I'll remind the DOE staff and national lab participants,
118 they should also use the microphone and again, identify
119 themselves if they're called upon during the workshop to respond
120 to a Board question.

121

122 Public comments can also be submitted during the workshop via
123 the online meeting, viewing platform using the Comment-For-
124 Record form. If you are viewing the presentation in full-screen
125 mode, you can access the Comment-For-Record section by pressing
126 the ESC key. A reminder on how to submit comments will be
127 provided, will be displayed during the breaks. The Board values
128 these comments very much. We will react, read them as part of
129 our, no, we will not be the, they will be included in our
130 record. Comments submitted online during the workshop will also

131 be posted to the Board's website shortly after the workshop
132 adjourns.

133

134 Written comments and any other written materials may be
135 submitted later by mail or email to the points of contact noted
136 in the press release for this workshop, which is also posted on
137 our website. Those will become part of the workshop record and
138 we... will be posted, along with a transcript of the workshop and
139 the presentations you will see today.

140

141 This workshop is being webcast live and it's being recorded so
142 you'll see some cameras around the room. Depending on where
143 you're sitting, you might be part of the webcast and the
144 recording. So, the archived recording will be available on the
145 Board's website by September 4th of this year. A transcript,
146 sorry... transcript will be available by October 30th.

147

148 Okay, so that's the conduct, that's how we're going to do this.
149 What are we trying to do? Today's event is part of the Board's
150 continuing review of DOE activities related to the management
151 disposal of spent nuclear fuel and high-level radioactive waste.
152 This Board is part of the Board's ongoing review of DOE Office

153 of Integrated Waste Management consent-based siting efforts. We
154 recognize that DOE's in an early stage and multiyear enterprise.

155

156 One purpose, our purpose of the workshop, or one purpose is to
157 learn more about how that's going, what it is, learn more about
158 DOE's consent-based siting efforts, and other siting efforts as
159 well, for which there's some experience around the world.

160 Throughout the existence, its existence, the Board has
161 interacted with other national and international radioactive
162 waste management organizations to gain perspectives to support
163 its review of DOE activities. Based on these experiences, the
164 Board recommended that DOE learn from domestic siting
165 experiences and from siting processes and other nations in
166 implementing the consent... it's consent-based siting efforts.

167

168 Our speakers this morning will provide additional insights on
169 the lessons learned from international and domestic siting
170 efforts of facilities or to storage or disposal spent nuclear
171 fuel and high-level radioactive waste, and other types of
172 radioactive waste as well. Those speakers will provide
173 information that should be useful to the DOE and to the Board's
174 evaluation of DOE's current consent-based siting activities. And

175 then in the afternoon, we'll hear from DOE on how it's
176 incorporating lessons from international domestic siting
177 experiences and from environmental justice efforts.

178

179 Today's workshop presentations and discussions, along with DOE's
180 comment and consent-based siting presentations tomorrow in our
181 summer meeting, form a basis for the Board's evaluation of the
182 technical and scientific validity of DOE's consent-based siting
183 efforts.

184

185 At this workshop, we'll start the day with two short
186 presentations that provide additional context for the rest of
187 the day. This will be followed by presentations on the
188 repository siting processes in Canada, Sweden, and Switzerland,
189 a presentation on the panel's... the past siting experience in
190 United States and a facilitated discussion of the morning
191 presentations. Then after the lunch break, we have, we'll have
192 presentations from the Office of Integrated Waste Management,
193 followed by a facilitated discussion of all, on all workshop
194 topics.

195

196 We have a packed agenda. Today's workshop will start with a
197 short presentation from Dr. Bret Leslie from the Board staff,
198 who will provide additional context for the Board's review of
199 DOE's efforts on consent-based siting and Board's ... perspectives
200 on siting.

201

202 Then Natalia Saraeva from DOE will introduce DOE's consent-based
203 siting approach to siting one or more federal interim storage
204 facilities.

205

206 Lisa Frizzell, from the Nuclear Waste Management Organization,
207 will join us from Ontario, Canada, virtually, to describe siting
208 of a geologic repository in Canada.

209

210 Saida Engström, from Sweden, will present on the Swedish
211 geological repository siting effort. Then we'll have a 10-minute
212 break at 9:40 AM.

213

214 After the break, Piet Zuidema, a Swiss consultant, will present
215 on the geological repository siting effort in Switzerland.

216

217 After that, Dan Bullen, a former Board member now on the staff
218 of the Defense Nuclear Facilities Safety Board, will describe
219 his experience with the Nuclear Waste Negotiator and the siting
220 of monitored retrievable storage facility, which is the legal
221 name for federal consolidated interim storage facility that is
222 pursued under the Nuclear Waste Policy Act.

223

224 Then Bret, from the Board staff, will facilitate a panel
225 discussion with Saida, Piet, and Dan on the morning's
226 presentations.

227

228 Lunch break will begin at 11:55 for one hour. Following the
229 lunch break, we will have two presentations from the DOE Office
230 of Integrated Waste Management, Natalia Saraeva and Angelica
231 Gheen, who will be joining us virtually, will be describing how
232 DOE's incorporating international domestic siting best practices
233 and lessons learned.

234

235 We'll have a 10-minute break starting at 2:45, Mountain Time.
236 Marissa Bell, from DOE, will then present how DOE is using best
237 practices and lessons learned in environmental justice and its
238 consent-based siting program. Then Bret will facilitate a

239 general discussion, panel discussion with Saida, Piet, Dan, and
240 Natalia. Also, Marisa and Juan will be on the discussion.

241

242 We'll have a public comment period beginning at 4:45 PM, and
243 we'll adjourn the meeting at about 5 PM, Mountain Time, at which
244 time the webcast will stop.

245

246 We'll have a 30-minute open house to allow attendees to engage
247 with Board members or our invited speakers, and with DOE staff
248 and contractors.

249

250 DOE's brought a demonstration booth, you see in the back, with
251 some three-dimensional models and some printed materials that
252 they've developed as part of their consent-based siting efforts.
253 And those items are also in the back. And, of course, we have a
254 cool virtual reality setup as well.

255

256 Much effort went into planning this meeting and arranging
257 presentation, so I want to thank our speakers for making
258 presentations at the workshop today, and thank those who have
259 traveled great distances to join us and help us learn. Also
260 thank those who participate in the Board fact-finding meeting on

261 consent-based siting that was held virtually on June 29th of
262 this year. Obviously, that's helping us all in doing our work.
263 Thanks to a Board member Steve Becker, Lee Peddicord, and Scott
264 Tyler on our so-called small Board team, who lead the Board's
265 review of consent-based siting and helped to develop the
266 workshop. Thanks also to the Board staff, Bret and Jo Jo Lee for
267 doing all the hard work and getting things together.

268

269 Yesterday, by the way, the Board did visit the spent nuclear
270 fuel and high-level radioactive waste facilities at Idaho
271 National Laboratory. It was an excellent tour. We really
272 appreciate it. We thank DOE's Office of Environmental
273 Management, Office of Environmental Management, Nuclear Energy
274 and Naval Reactors, for hosting us and providing us with very,
275 very, very useful information during the tours. So again, we're
276 very appreciative of that.

277

278 So please, if you have your cell phones, so, please mute them
279 and let's begin and, Bret, hand it over to you.

280

281 LESLIE: And I'll wait till they pull up the slides. Thank you.
282 Okay. Nathan, thank you for making that brief introduction. As

283 he said, we're going to, both myself and Natalia, will just have
284 five minutes of brief background so that our audience, both here
285 in the room and around the world, have a little more context for
286 why we're conducting this meeting.

287

288 So, Nathan briefly mentioned our mission. I think it's important
289 to actually put it down in a slide, but we really are focused on
290 evaluating the technical and scientific validity of what DOE is
291 doing under the Nuclear Waste Policy Act. And down below are
292 some of the languages straight from the Act itself on what
293 things Congress envision the Board focusing on. So, for example,
294 packaging of spent nuclear fuel and transportation of those,
295 that waste either to a repository or storage facility.

296

297 So, this is part of our mandate, and part of what we're doing.
298 And what you'll hear is the consent-based siting is just part of
299 what DOE is doing to accomplish the mission of trying to
300 establish one or more federal consolidated interim storage
301 facilities.

302

303 So as Nathan mentioned, we are looking at this to gain
304 information, both from our international participants to update

305 us, since we have done some work on siting in the past, but it's
306 been a while since we've asked our international colleagues to
307 tell us what's happened in the intervening 10 years. And the,
308 again, one of the things that I just said was that we look, the
309 Board looks at things in a holistic and integrated manner. And
310 so, at the bottom, you'll see that that consent-based siting is
311 part of one-quarter of what the DOE project actually entails to
312 get to that consolidated interim storage. And so even though
313 we're hearing about consent-based siting, back in March we heard
314 basically on the bottom three bullets. So now we're getting a
315 larger picture. Even though DOE is just starting, we're getting
316 a fuller picture of the entire program.

317

318 So, what are the Board's perspectives on siting? Well, as I
319 mentioned, we've done quite a bit of work on gaining knowledge
320 from our international colleagues. Out in the check-in area,
321 there are two reports. We have an overview and summary and a
322 detailed analysis, where we've captured the lessons learned,
323 from both the successes and failures of various programs and
324 nations, as they get to a point, focused on geologic disposal.
325 We think many of the lessons learned also apply for getting to a
326 federal consolidated interim storage facility.

327

328 What the Board found is siting is a socio-technical challenge.
329 Each country is faced with having to address both social
330 acceptability and technical suitability to finding a site. But
331 the siting approaches differ between countries and really
332 reflect the radioactive waste policy of each country. And one of
333 the things that we've asked our international speakers today are
334 to kind of highlight those lessons that are really transferable
335 between countries.

336

337 So, in that report, the Board basically said each country goes
338 through a social filter and a technical filter. Since then,
339 we've developed that concept a little bit more in our 2021
340 report on *Six Recommendations for How to Move the Nation's*
341 *Nuclear Waste Management Program Forward*. We came up with this
342 figure which, again, identifies that you can't get to an
343 acceptance of a site, a mutual acceptance of a site, unless you
344 somehow address both the social acceptability and technical
345 suitability. And the idea of this is they have to be kind of
346 ongoing at the same time. You, they can't be looked at
347 separately and hope it meet, meets together. So one of the
348 things, and even though this was developed for a repository,

349 where an underground research laboratory is kind of the way the
350 public and the science is done, and serves a very important
351 purpose in international programs, we have also found as we have
352 gone to two consolidated interim storage sites, that if you were
353 to replace an underground research laboratory with a
354 consolidated interim storage facility, the same concept applies.
355 And that, that's kind of why we've identified this figure, and
356 we think it's still relevant for the consolidated interim
357 storage facility. And I think that's it, and with that, Nathan,
358 you can do the next person, introduce Natalia.

359

360 SIU: Yeah, next speaker Natalia Saraeva from DOE.

361

362 SARAIEVA: Good morning. I'm Natalia Saraeva. I'm the team lead
363 for consent-based siting at the U.S. Department of Energy,
364 Office of Nuclear Energy. First, I'd like to thank the Board for
365 organizing this workshop and also inviting us to be part of it.
366 Definitely it will provide a lot of really important learning
367 opportunities and opportunities to engage with our international
368 colleagues and also with the Board members.

369

370 So, Nathan asked to provide a quick overview on where we are
371 with consent-based siting process, and tomorrow's... during the
372 tomorrow's public meeting, we'll have a more in-depth discussion
373 and overview.

374

375 So right now, we are focusing on the siting efforts for a
376 federal consolidated interim storage facility. This is
377 consistent with the congressional directions and... and funding.
378 So, we restarted the efforts in 2021, following the
379 congressional appropriations that had those directions. And we
380 are following those congressional directions and congressional
381 directions, also directs us to identify sites for federal
382 interim storage facility and existing authority in using
383 consent-based siting.

384

385 So, consent-based siting didn't just start in 2021. In 2015, our
386 department started developing consent-based siting process,
387 following the recommendations from the Blue Ribbon Commission on
388 America's Nuclear Future. So, in 2021, we focused our efforts on
389 the interim, federal interim storage facility only, again,
390 consistent with congressional directions and actions. However,
391 the lessons that we've learn through that process will be

392 applicable for future siting of waste management facilities, and
393 geological repositories, including.

394

395 So, we, as Nathan and Bret mentioned, we are in the beginning of
396 a long road. Right now, we are not looking for any volunteers to
397 be the host. Right now, we're in the stage of planning and
398 capacity building. Again, we'll have more in-depth discussion
399 about that next week, sorry... next week, tomorrow. And this
400 year, we issued revised consent-based siting process document,
401 that is also available on our booth over there. It's available
402 on the website. And again, tomorrow, we'll have a more detailed
403 discussion.

404

405 We also announced the selection of our awardees for our consent-
406 based siting consortium, which will help us to carry out mutual
407 learning with communities and organizations that are interested
408 to learn more about what the spent nuclear fuel management is
409 and what consent-based siting is. And following that work, we'll
410 update our process document, as needed. And after that, which
411 will be approximately two years from now, we'll be moving into a
412 next phase, which will include soliciting interested in building
413 communities to raise their hands.

414

415 So again, we're not right now looking for any volunteers. We're
416 in the stage where we hope to build capacity, knowledge base,
417 and we rely heavily on the public feedback during the process.
418 We had a request for information when we restarted the process,
419 and we're using this feedback to inform our next steps.

420

421 And with that, I also would like to finish probably with a
422 caveat. Again, our international partners' efforts mainly
423 focused on siting of deep geological repositories. Department of
424 Energy focus right now is in interim storage. So technically,
425 they are very different efforts, but there is, of course, a lot
426 in common in the social component of it and the siting
427 processes. So, there is a lot to learn. And again, as I said,
428 what we learn through this process will be applied for our
429 future siting efforts.

430

431 So, thank you, again. I'm looking forward to hearing from our
432 international partners and engaging in discussion.

433

434 SIU: Thanks, Natalia. Okay, are we ready with the virtual
435 presentation? The next speaker would be Lisa Frizzell, from the

436 Nuclear Waste Management Organization in Canada, graciously
437 spending some time with us today. Oops, can't hear you, Lisa.

438

439 FRIZZELL: -- to be here today virtually. Can you hear me? Are
440 you able to hear me? I'm not sure if you're able to hear me.

441

442 SIU: Okay. We hear you now.

443

444 FRIZZELL: Are you able to hear me?

445

446 SIU: Great. Thank you.

447

448 FRIZZELL: Okay. All right. So, thank you so much for inviting
449 me to participate today. And I'm so pleased that you're taking
450 the time to learn from other countries, including Canada, about
451 siting processes for deep geological repositories. Because, you
452 know, in my view, these projects are important not only to each
453 of our countries, but in the global context. And each step
454 forward provides experience and insights that can really help
455 drive success for others. And I would argue that the success of
456 one nuclear waste project is a success for all. So I serve as
457 Vice President of Communications at Canada's Nuclear Waste

458 Management Organization, or NWMO, and I'm joining you today from
459 our office in Toronto.

460

461 And I'd like to acknowledge that our office is situated on the
462 traditional and ancestral homelands of many nations, including
463 the Mississaugas of the Credit, the Anishinaabe, the Chippewa,
464 the Haudenosaunee, and the Wendat peoples, who have inhabited
465 this region for time immemorial. And acknowledgments like this,
466 reflections on the land and the history of the people who have
467 cared for it, are a really important part of Canada's
468 reconciliation journey with indigenous peoples.

469

470 And today, I'm going to share lots of information about our
471 consent-based siting process, which has been a really
472 foundational aspect of Canada's plan, to ensure the safe, long-
473 term management of used nuclear fuel, but first, I'm going to
474 start with a bit of context that I think might be helpful. So,
475 the Nuclear Waste Management Organization is an independent,
476 not-for-profit organization, implementing Canada's plan for the
477 safe, long-term management of used nuclear fuel in a deep
478 geological repository. But the need for a long-term management
479 solution for our used nuclear fuel has really been studied and

480 discussed in Canada for decades. And we're actually not the
481 first organization to pursue this goal. In fact, in the 1980s,
482 Canada's program was leading the world. And at that time, a
483 company called Atomic Energy of Canada, Limited, have fully
484 developed the concept for deep geological disposal. And in 1989,
485 the government struck an independent Environmental Assessment
486 Commission called the Seaborn Panel, and that panel worked for
487 nearly 10 years, and they studied every facet of the concept.
488 And in 1998, that panel concluded that from a technical
489 perspective, the safety of deep geological disposal had been
490 adequately demonstrated, but from a social perspective, it had
491 not. So, the concept had not been demonstrated to have broad
492 public support, and so it didn't move forward. And Canada's
493 program with that decision was really set back by decades.

494

495 Now, the outcomes of that work led the Canadian government to
496 pass the Nuclear Fuel Waste Act in 2002. And that Act required
497 the major owners and stewards of used nuclear fuel in Canada to
498 establish the Nuclear Waste Management Organization. And the
499 lessons learned through that early setback really continue to
500 shape the way we do things today.

501

502 So, we know that of course, there are technical and scientific
503 requirements for this project that have to be met. And generally
504 speaking, those are clear and well understood, but we also
505 recognize that for many people, this topic is not so much a
506 technical one as an emotional one. And to move forward, the
507 project we're working on has to be acceptable, not only from a
508 technical perspective, but from a social perspective as well.

509

510 So, from the outset, we've gone to really great lengths to make
511 sure our work is informed by public input. And from the very
512 beginning, we've relied heavily on engagement processes that are
513 centered around creating dialogue with Canadians and indigenous
514 peoples to support our decision making. In fact, the entire plan
515 we're implementing emerged through a three-year dialogue with
516 both specialists and the general public, including indigenous
517 peoples. And that dialogue was designed to determine the values
518 and priorities important in Canada in thinking about how we
519 manage used nuclear fuel. No, of course, not everyone agreed on
520 everything, but we did find a lot of common ground, and that
521 formed the basis of the plan.

522

523 So, for example, Canadians and indigenous peoples said, they
524 wanted a long-term plan for the used fuel, and the country
525 should assume this responsibility now, because it's not
526 acceptable to leave the burden of the waste we created to future
527 generations. And while the chosen approach had to satisfy lots
528 of objectives, it was clear that the expectation is that it used
529 best international practice, and that safety and security has to
530 be paramount. We can't sacrifice that for anything.

531

532 And we also heard that we need to balance our technical plan
533 with a flexible approach to implementing it that's designed to
534 evolve with the world around us. And we found that balance, we
535 call it adaptive phased management. And really, it's an
536 implementation approach that's adaptive to change, aligns with
537 international best practice, and ensures that Canada's
538 repository will be built in an area with informed and willing
539 hosts.

540

541 So technically, the project has as its endpoint, the safe
542 containment and isolation of used nuclear fuel in a deep
543 repository, located in a suitable rock formation, and the used
544 fuel will be continuously monitored and retrievable for an

545 extended period of time. But adaptive phase management isn't
546 just the technical approach, it's also a principled commitment
547 to Canadians and indigenous peoples that will work with them,
548 and that Canada's plan will adapt as it needs to.

549

550 So, decision making is inclusive, phased, and adaptive. It's
551 responsive to ongoing public input, advances in technology, new
552 research, indigenous knowledge, and even changing societal
553 values. And really what all this means in practice, is including
554 all kinds of people in just about everything we do. And it's
555 through this kind of collaboration, that we've been able to move
556 ahead with the goal that future generations won't need to worry
557 about the used fuel we've created.

558

559 And since the NWMO is responsible for all of Canada's used fuel,
560 including fuel created using new or emerging technologies, this
561 flexible approach that we're implementing also prepares us to
562 responsibly manage, not only fuel from today's operating
563 reactors, but also fuel from tomorrow's small modular reactors,
564 or other advanced nuclear reactors. And all of the used fuel
565 will be part of that same fundamental technical solution, which

566 is the deep geological repository designed to contain and
567 isolate it.

568

569 So, in a nutshell, that was the plan that we proposed to the
570 federal government in 2005. And in 2007, they adopted adaptive
571 phased management as Canada's plan, and tasked us at the NWMO
572 with implementing it. And at that point, we moved into
573 developing and implementing our consent-based process to select
574 a site for the repository. And that began with another public
575 dialogue, this time over two years, and focused on identifying
576 what an open, transparent, fair, and inclusive process for
577 making this decision would look like.

578

579 So, in other words, this process and even the way it was
580 designed has always been collaborative and community led. And
581 from the beginning, we've been clear that Canada's plan will
582 only proceed at a site with informed and willing hosts, where
583 people who live in the area understand what it means to host a
584 project like this, and support having it located there. And
585 we've only ever worked in areas where at least one community
586 voluntarily expressed interest in participating. And in fact,
587 when we launched the site selection process in 2010, 22

588 communities raised their hands, expressing interest in learning
589 about the project and exploring their potential for hosting it.
590 It really was extraordinary.

591

592 Now today, after a gradual narrowing down process that's been
593 guided by increasingly more intensive social engagement and
594 technical study, we're now focused on two potential siting
595 areas, both in the province of Ontario. And we're working in
596 close cooperation with municipal and indigenous communities in
597 both areas, supporting their processes to decide whether they
598 want to host the project, and we're working toward our goal of
599 selecting a single site next year, so in 2024.

600

601 So, we're at a pretty exciting point in the NWMO's site
602 selection process. And to give you a sense of what our process
603 has looked like in practice, I'm going to share a bit more about
604 some of the key components of the approach and some of the
605 things we've learned along the way that have enabled our
606 progress. Now, one of the core values of our consent-based
607 siting process is respecting the rights of indigenous peoples,
608 and recognizing that the success of Canada's plan can only
609 happen with their participation and support. So, we have an

610 ongoing dialogue with our very active Council of Knowledge
611 Holders about reconciliation, and also, the latest thinking
612 about indigenous knowledge and how we can align it with our
613 work. We regularly host Indigenous Knowledge and Western Science
614 workshops. And at those, we seek to bring those two worldviews,
615 or ways of knowing, into dialogue. And what we've learned is
616 that drawing on knowledge from multiple worldviews leads to
617 better, more informed outcomes, gives us more data.

618

619 And we've embraced a commitment to reconciliation, which is all
620 about learning from and addressing historic wrongs and working
621 together to co-create a better future. And in many ways, I can
622 say we've made reconciliation a central part of our
623 organizational culture. And as part of that commitment, we
624 released a Reconciliation Statement in 2018, that acknowledges
625 the historic and ongoing injustices experienced by indigenous
626 peoples, and a Reconciliation Policy the following year, which
627 we've been using as a foundation to put our words into action.

628

629 Now, in addition to our work on reconciliation and indigenous
630 engagement, we've also worked with all kinds of communities to
631 foster dialogue, demonstrate transparency, and work towards

632 partnership. We've made efforts and investments to support
633 potential host communities and help them build the capacity they
634 need to fully examine the project so they can make an informed
635 choice about their willingness to host it, because our approach
636 to consent-based siting really means it's up to the communities
637 themselves to decide the best way to define their willingness to
638 host the repository, to decide whether they're ultimately
639 willing to host it, and if so, how they'll express that
640 willingness. It also means that the communities are actively
641 engaged in helping to shape the kind of supportive and resilient
642 partnerships we'll need to successfully implement this project
643 together.

644

645 Now, in our experience, a consent-based siting process needs a
646 foundation of mutual understanding before a decision can really
647 even be considered in good faith by either party. And something
648 that's been critical to the success of our process is what we
649 call the Learn More Approach. So, when communities became
650 engaged in the siting process, we never asked them to commit to
651 or even support the idea of locating the project in their area.
652 All we asked from them was to agree to develop a better
653 understanding of the project, to learn more. And we signed what

654 we called Learn More Agreements with those communities, and that
655 provided them with the resources they needed to explore their
656 interest in hosting the repository. And this approach really
657 gave community members the space to learn, because they weren't
658 being asked to commit to the project before they had a full
659 understanding of its impacts and benefits, and it gave us the
660 space to work together with them to learn about how the project
661 might fit in each area, both from a technical perspective, and
662 also in a way that could enhance local wellbeing as the
663 communities themselves defined it. And we've promoted
664 initiatives to support learning in a wide variety of ways, in
665 potential siting communities more broadly among interested
666 Canadians and indigenous peoples, and even globally as we've
667 seen interest in our work grow.

668

669 And when siting areas, we set up local Learn More Centers, where
670 people can drop by to ask questions and share their thoughts
671 about our work. And we regularly support a wide variety of
672 learning activities and informational events, many of them are
673 driven by local community liaison committees that were set up by
674 municipal councils to facilitate learning on topics related to
675 the project. And some of these activities include things like

676 hosting and participating in many, many events to share
677 information. We host open houses and workshops. We participate
678 in community fairs. We make presentations to service groups and
679 basically show up wherever we can to answer questions and share
680 information about Canada's plan and the work we're doing to
681 implement it. And we even have a huge traveling exhibit that we
682 call the Mobile Learn More Center that travels around the
683 province to help tell the story of Canada's plan for used
684 nuclear fuel.

685

686 Now, over the last year, we've also completed around 30 studies
687 on topics that communities defined as important to them,
688 exploring impacts on things like jobs, local industries, like
689 tourism and agriculture, on infrastructure, and on local
690 services. And when groups reach out to us with an interest in
691 learning more, we're happy to host them. So we routinely welcome
692 technical experts, policymakers, and community leaders, and
693 members of the public to our Discovery and Demonstration Center,
694 which is the facility where we prototype and test the components
695 of the multiple barrier system that we'll use in the repository
696 so that people can really learn more about our work by seeing it
697 firsthand.

698

699 And over the past year, we've had community representatives, and
700 even Ontario's Provincial Minister of Energy, go all the way to
701 Finland to see their Onkalo facility, which was a hands-on
702 experience, where they're able to see what a deep geological
703 repository actually looks like and imagine how a facility like
704 that would fit in Ontario communities. So, all of these are
705 examples of initiatives to support learning, and they're
706 designed to help people make informed decisions that are based
707 on facts, whether they agree with us or not, because this
708 project has always been informed by a diversity of views or
709 perspectives.

710

711 And I would say that while the NWMO's mandate, of course, lies
712 in Canada, we were also eager to share and learn from insights and
713 groups from other countries, including the Nuclear Waste
714 Technical Review Board. We've learned a lot from other countries
715 undertaking similar projects, and we see that we have a role to
716 play in sharing our experience, because by working together
717 around the world to advance these projects, we can demonstrate
718 that there are solutions for the safe and long-term management
719 of used nuclear fuel, and they're viable.

720

721 In fact, we are looking forward to hosting the Nuclear Waste
722 Technical Review Board at our Discovery and Demonstration Center
723 later this year. And we see opportunities like these, which
724 reflect our commitment to transparency and mutual learning and
725 international collaboration, as really important to that global
726 effort to safely and responsibly manage used nuclear fuel.
727 Because I think we know that the safe, long-term management of
728 used nuclear fuel really isn't just a challenge for a handful of
729 jurisdictions, it's an important consideration for countries
730 around the world, harnessing nuclear energy to power their
731 communities.

732

733 And I'm so pleased that you'll be hearing today from
734 representatives from Finland and Sweden, who, of course, are two
735 of the nation's furthest along in their process, and we've
736 certainly learned a lot from them in our journey. We also know
737 that Switzerland has identified their site, France has both
738 identified a site and applied for a construction license, and
739 multiple other countries, Japan and the UK, for example, are at
740 various phases of their process. And these projects really unite
741 us as an international community that's dedicated to doing

742 what's right as our respective countries' governments
743 increasingly lean into nuclear to provide clean and reliable
744 energy.

745

746 So, it's great to see the Nuclear Waste Technical Review Board
747 host this webinar, and to see interest from policymakers,
748 government, and community leaders looking to learn from
749 countries around the world. And I also think that the special
750 relationship between the US and Canada will play an important
751 role in fostering knowledge and sharing related to the safe,
752 long-term management of used nuclear fuel in North America.

753

754 And just by way of example, in just the last six months or two
755 nations have taken important steps forward on used nuclear fuel.
756 In March, the US Department of Energy and its Canadian
757 counterpart, Natural Resources Canada, issued a joint statement
758 on nuclear energy cooperation. And that statement showed that as
759 we think more and more about advanced nuclear technologies, we
760 need to be thinking about responsible waste management at all
761 stages of its life. And this understanding between our two
762 countries affirms that, and I'll quote here, "Consent-based
763 siting for the long-term management of radioactive waste is part

764 of our common vision and foundational to building trust and
765 support for nuclear energy." And consent-based siting is,
766 indeed, part of our common vision.

767

768 The NWMO and the DOE took another important step toward
769 developing and strengthening knowledge sharing by announcing a
770 statement of intent to cooperate on this topic back in May, and
771 that agreement will allow for more robust information sharing
772 for science and technology programs and for engagement
773 activities, to make sure that both of our organizations are
774 benefiting from each other's experience. It also lays the
775 groundwork for a program of exchanges and visits that enable the
776 NWMO and DOE leaders to learn from each other through hands-on
777 experiences in each other's organizations, including on
778 information and best practices around consent-based siting. So
779 that as the US begins to consider its processes for consent-
780 based siting, our lessons learned can help inform that approach.
781 And really making sure that we're learning from each other,
782 sharing key information, and developing processes that reflect
783 best practices is so important to leading the way forward
784 because we can't stand back and ask the next generation to start
785 again.

786

787 As I said earlier, we know that the success of any one nuclear
788 waste project of any shape or size is a success for them all.
789 They all help build confidence. And that's why collaboration,
790 even across borders, is so important and why I'm so happy to
791 take part in this workshop. And while I'm here to share Canada's
792 perspective, I would also acknowledge that as the US explores
793 moving forward with its own consent-based siting process, I have
794 every confidence we're going to learn a lot from that, too.

795

796 So, with that, I will stop talking, and I look forward to
797 answering any questions you might have.

798

799 SIU: Thanks, Lisa. And thank you for answering many of the
800 questions that are built into our agenda. As I mentioned at the
801 beginning, we have a small Board team that's taking the lead on
802 consent-based siting. Steve Becker and Scott Tyler are here, Lee
803 Peddicord is offline. So, start with questions from the small
804 Board team. Steve, please.

805

806 BECKER: Steven Becker, NWTRB Board member. Thank you, Lisa, for
807 an excellent presentation. I'm really glad you were able to join

808 us this morning. I noted how central engaging indigenous people
809 has been to Canada's process. Could you please talk just a
810 little bit more about how indigenous knowledge and perspectives
811 have shaped Canada's siting efforts?

812

813 FRIZZELL: Yeah, sure. I think, you know, this is an area where
814 we've learned so much as we've been implemented, and from
815 engaging with indigenous communities and that Council of
816 Knowledge Holders that I told you about. And just to give you a
817 few examples, I mentioned the, the workshops that we have
818 regularly between indigenous Knowledge Holders and Western
819 science. And really, they've taken the initiative in those
820 workshops to explore topics where both worldviews have knowledge
821 and experience to contribute.

822

823 So, for example, they've looked at topics like water and water
824 protection, copper, geology, and rock. There's a tremendous
825 amount of knowledge, both among Western scientists and
826 indigenous Knowledge Holders about those topics, and exploring
827 those in dialogue together, as I said, gives us more perspective
828 and help, help shape some of the thinking, the planning, and the
829 engagement that we do.

830

831 I'll give you another very specific example, because a lot of it
832 comes down to working with indigenous peoples. We had a request
833 a few years ago for more information about water and water
834 protection. And we've come to understand, of course, water
835 protection is important to all of us. It's one of the reasons we
836 implement a project like this. And in many indigenous cultures,
837 women, in particular, have a special relationship with water.
838 And so, as we started preparing the presentation that we were
839 taking to this indigenous community that requested information
840 about water, we actually looked for ways to develop it, working
841 with indigenous peoples, including in that community. So we
842 explored concepts like water has memory. And our scientists
843 thought about that and said, "Yeah, water does have memory. You
844 know, we can look at traces of water deep underground and
845 understand the history of that water, if it's been in contact
846 with the surface, or not, and over what timeframes and what path
847 it's taken." And there were lots of indigenous contributions to
848 that as well. And so, we developed a draft, we took it to our,
849 the Knowledge Holders we work with, and refined it, we took it
850 to a women's circle, and refined it some more, it was always co-
851 presented with a Western scientist and an indigenous Knowledge

852 Holder. And that really shaped the way we thought about and
853 talked about and engaged on the topic of water. So those are a
854 few examples. I hope that helps give you some idea of how we're
855 going about this.

856

857 BECKER: Thank you.

858

859 TYLER: Scott Tyler, Nuclear Waste Technical Review Board
860 member. And, Lisa, first off, thank you very much, really
861 appreciate your presentation and the depth you went into. I have
862 a question regarding how your organization has interacted with,
863 with the provincial level governments. How, if you can give us
864 some specific examples of how your group has engaged with that
865 level of government, and perhaps also how your group facilitated
866 engagement between the communities that you're working with and
867 the provincial governments?

868

869 FRIZZELL: Certainly. So, yeah, just thinking about how to, how
870 to best describe this. So, as you may be aware, the project
871 we're implementing is under federal government jurisdiction,
872 we're effectively implementing a federal law. However, of
873 course, there's an interest from provincial governments,

874 particularly in areas where the site could be located. So as
875 part of our engagement in siting areas, potential siting areas,
876 from the beginning, we've engaged with local elected officials
877 with all levels of government, including provincial, we've also
878 gone to great lengths to keep relevant government, provincial
879 government departments engaged, in particularly the Department
880 of Energy. So, we've had officials, we've done briefings, of
881 course, but we've also had officials, elected officials and
882 staff representatives, touring our facilities, learning about
883 the work we do. And as I mentioned, our provincial energy
884 minister, actually, last year traveled all the way to Finland to
885 see the repository there, so he could understand firsthand what
886 this would mean for the province of Ontario.

887

888 The other kind of thing I would add is that the, sorry,... I had a
889 beep off screen here. The other thing I would add is that the
890 waste owners, so the utilities that were required to establish
891 the NWMO and are, are required to fund our work, are also either
892 crown corps, or owned by the provinces in which they reside. And
893 so there are mechanisms through that, that we engage with the
894 relevant provinces as well. I can say, you know, we've been
895 fortunate to have very engaged officials at all levels. And in

896 Ontario, I would say the provincial government has been
897 particularly proactive. And we've only seen the interest in the
898 work grow, particularly as the dialogue around nuclear energy
899 has continued to grow and, and the potential for expansion of
900 nuclear energy in light of climate change.

901

902 TYLER: Thank you very much. Appreciate it.

903

904 BECKER: Hi, Lisa, this is Steve Becker again from the Board. It
905 sounds as though Canada had an earlier experience where the
906 technical and social processes were not well integrated, and has
907 more recently, it sounds as though you've been very successful
908 in integrating those two components. I'm just wondering what you
909 see as the biggest impediments to successfully carrying out that
910 integration of the social and technical?

911

912 FRIZZELL: Oh, that's a good question. So, we have definitely
913 sought to integrate the two. So to give you a sense, maybe a
914 little more specifically of what that looked like, when a
915 community first expressed interest to enter into the siting
916 process, we started with a very preliminary desktop technical
917 review, to determine if there were any obvious reasons, based on

918 public information available, that a community would not likely
919 be a suitable place for a repository. And we did screen at one
920 community at that stage on technical reasons. It looked like
921 there, the geology probably wasn't going to be suitable in that
922 area just based on information that was already known. From that
923 point forward, it's been a very stepwise process involving both
924 increasingly intensive technical study. So, we started with more
925 expansive desktop studies and then gradually moved into field
926 work, as well as social engagement that was partly formed to
927 engage people on the technical study that they, that was
928 happening in their area, but also driven by the questions and
929 concerns that communities brought to the table. So they very
930 much shaped, shaped the way that we engaged. So, I guess, if I
931 think about impediments, I guess one of the challenges, I would
932 say, may have been pacing. We had multiple communities in the
933 process at, at the same time, for a while. We're now down to
934 two, but there were times when we had as many as 21 we were
935 actively engaging on. And as we got further into the process,
936 that each of the siting areas' needs became more customized. So,
937 we had to kind of build our capacity to be able to manage that.
938 So, I would say that's one of the, one of the challenges in
939 having so many communities to work with, I would say, also

940 contributed to the fact that it's taken us a little bit longer
941 to get through the siting process than our initial estimates had
942 anticipated.

943

944 I would say as well, of course, as communities that expressed
945 interest got further into the process, working together with
946 them, we had to, of course, engage more of their neighbors. In
947 cases where the indigenous communities, whose territories the
948 site was in, weren't already engaged from the outset, we had to
949 engage them further. And so that's appropriately required a
950 tremendous amount of work and engagement to kind of bring people
951 along, and also to facilitate our learning to understand how the
952 project might fit in any given area. So those are a few
953 examples.

954

955 BECKER: Thank you.

956

957 SIU: We have a little bit of time for a question, Ron.

958

959 BALLINGER: Yeah, I'm the newest Board member, and so I can ask
960 almost heretical questions. You use the word "waste owners," and
961 that's an interesting word, because it implies that there's

962 somebody that actually owns the waste. At the interface between
963 the so-called technical side and the social side, have you
964 thought about using the word "our" when it comes to waste?
965 Because after all, it is your country's waste.

966

967 FRIZZELL: Yes.

968

969 BALLINGER: And that includes not just the, the generation of
970 power, which the people use, as well as the people.

971

972 FRIZZELL: Yeah. Yes.

973

974 BALLINGER: So, there's a societal, to my mind, connection,
975 which is a little bit harder than just us or them.

976

977 FRIZZELL: Yes, it's a fair point. And we do often refer to
978 Canada's used nuclear fuel, and our organization, the NWMO, who
979 is responsible for the long-term management of all of Canada's
980 used nuclear fuel. When I refer to "waste owners," I'm referring
981 to those who are currently responsible for its care because we
982 don't, at the NWMO, assume responsibility for that used fuel
983 until the repository's ready for operations, and we're ready to

984 pick it up and move it to the repository. It is, it is a fair
985 distinction. I appreciate you calling that out.

986

987 BALLINGER: It is it not --

988

989 FRIZZELL: It is Canada's used nuclear fuel, and we certainly
990 heard loud and clear from Canadians and indigenous people that,
991 those of us who have benefited from the electricity that was
992 generated and creating this byproduct, should assume
993 responsibility as well for its long-term care.

994

995 BALLINGER: Well, I have another question. There's a, one of our
996 questions, it says, "What are the unanticipated challenges,
997 problems, da-da-da-da-da, and had implications for the siting
998 program?" Can we replace that word with "anticipated?" What were
999 the anticipated challenges?

1000

1001 FRIZZELL: So, well, I can, I can speak a little bit to both. I
1002 think one of the anticipated challenges was that we're
1003 implementing this project over decades, effectively. And so, I
1004 spoke a bit in my remarks about the adaptable nature of the
1005 plan, and that actually came through public input, because you

1006 know, Canadians and indigenous peoples told us very clearly,
1007 look, you're implementing this over generations, things will
1008 change. And even in just the time I've been with the NWMO, the
1009 way we communicate has changed. Social media, mobile phones, all
1010 of those things have advanced tremendously just in the way we
1011 communicate. We're seeing technical changes around us all the
1012 time as well. And so we anticipated that we needed to be
1013 adaptable; we didn't necessarily know how in every way. Great
1014 example of that is the pandemic. So that prompted us to have to
1015 pivot in a number of ways in the ways we scheduled work, the
1016 ways we engaged, some of our scheduling. And because the nature
1017 of the project that we're implementing is adaptable, we were
1018 prepared to do that.

1019

1020 Another example, I would say that's changing around us right now
1021 is the dialogue around us around nuclear energy, and its, its
1022 potential for helping to address climate change. So that's
1023 raised all kinds of prospects for additional or different types
1024 of fuel that we might need to manage in the long term. And that
1025 dialogue wasn't happening when we started implementing this site
1026 selection process. So that's influenced some of the ways we're

1027 planning for those outcomes and the ways that we're engaging and
1028 communicating and answering people's questions.

1029

1030 BALLINGER: Thank you.

1031

1032 SIU: Thank you very much, Lisa. I know, we're just filled with
1033 questions, but we do have to get on to other speakers. I do
1034 appreciate your taking the time. Okay.

1035

1036 FRIZZELL: It's my pleasure.

1037

1038 SIU: Our next speaker is Saida Engström, from Sweden, is going
1039 to talk about the Swedish experience. And please take your full
1040 time. We will, if necessary, run a little bit into the break.

1041

1042 ENGSTRÖM: Good morning, ladies and gentlemen. And thank you to
1043 the Board for inviting me to share with you the Swedish
1044 experience. It's a long journey that I'll try to summarize in 30
1045 minutes. And I have lots of slides, but I will be, the ones that
1046 deal actually with technology and scientific issues, I'll run
1047 through very briefly and stay with the siting process as such.

1048

1049 Sweden, a vast country, scarcely inhabited 10 million for a
1050 surface as big as France. A program that started in the '60s, 12
1051 reactors started, 50% of our electricity came from nuclear for,
1052 at that time, only 25 today, since six reactor, reactors have
1053 been phased out. Actually, all of them, for political reasons.
1054 And Sweden has been dancing this tango about more nuclear, less
1055 nuclear, more nuclear, less nuclear, depending if the right or
1056 the left has been in place. And now we are trying to build more
1057 nuclear, and the aim is to have one-third hydro, one-third wind,
1058 and one-third nuclear.

1059

1060 The Swedish Nuclear Waste Management Program is, ...now, I think
1061 it's okay now,... is, has been wisely thought about. I think my
1062 colleagues before I joined the, joined the program have been
1063 very wise, since the system has been integrated from the
1064 beginning. So, if you look at, with the mustard arrows, you see
1065 the low and intermediate-level waste. It's generated in nuclear
1066 power plants research, and so forth, and transported to a final
1067 repository, that's been in operation since '88. And the red
1068 arrows are for the high-level waste, that's transported from the
1069 nuclear power plants to cool in pools, underground pools. And
1070 that facility has been commissioned in operation since '85. It's

1071 been expanded since, and the site selection that I will be
1072 talking about, it's about the encapsulation facility, and the
1073 deep geological repository.

1074

1075 The last repository that we will be needing to build some,
1076 sometime in the future is the final repository for long-lived
1077 nuclear waste, once we have dismantled all nuclear power plants.
1078 And this has been actually in the program from the beginning. So
1079 that's also very important when you start your dialogue with
1080 society, that they know that you have an idea what you're
1081 starting, and what you want to achieve for a long term, also.

1082

1083 It was also extremely important to put in place a financing
1084 system that is dedicated for nuclear waste, and that has been
1085 taking place in the early '80s. So, when you pay your bill,
1086 electricity bill, you also pay a fee for nuclear waste. And that
1087 fee is funded and paid, pays actually for everything that deals
1088 with nuclear waste management, from research, operation of
1089 facilities, construction, of course, and also the salaries of
1090 the staff, and so forth.

1091

1092 So, the organization of nuclear waste management, this is a part
1093 where I think it's extremely important, how would success,
1094 succeed or not, is how you organize your nuclear waste
1095 management, and the distribution of responsibilities between
1096 different actors. There is not one organization that can do all
1097 the work with nuclear waste management.

1098

1099 So, for Sweden, being a small country with limited resources, it
1100 was very important for nuclear producers of, the producers of
1101 electricity, the owners of the nuclear power plants, not to have
1102 their own research and own repository. Of course, it made sense
1103 to, together, build a company and have them do all the work
1104 jointly. And they build what's now like SKB, Swedish nuclear
1105 power fuel and waste management company. And the interesting,
1106 compared to many other programs in the world, that SKB has 100%
1107 freedom to plan for safe management of the waste, to develop and
1108 build and operate facilities, as needed, to perform the
1109 necessary research, to perform the siting activities, to develop
1110 long-term planning for all activities and calculate the
1111 corresponding costs that's submitted to the government each
1112 three years, and also to fulfill the legal responsibilities of
1113 the NPP owners.

1114

1115 So linking to producers directly to their responsibilities have
1116 been, has been a key factor for success in Sweden, because if
1117 you fail, if we failed, at that time, to submit a good report,
1118 which we do every three years to the government about our
1119 research on how the program is advancing, it had an immediate
1120 consequence, they would shut down the reactor. So you knew if
1121 you didn't do the work on nuclear waste management, you will not
1122 be producing electricity anymore. So that incentive for the
1123 program has been extremely important, I think.

1124

1125 These are just to show you a little bit, this is the final
1126 repository for low and intermediate-level waste. It's under the
1127 Baltic, 50 meters under the Baltic, in galleries. This is the
1128 transport. As you can see, all nuclear power plants are
1129 strategically located on the sea. And all transports of spent
1130 nuclear fuel and nuclear waste, in general, is made by a
1131 dedicated and specially constructed ship, for that matter.

1132

1133 This is the central interim storage where all the waste is
1134 gathered. And this is, as you, I think all of you know that this
1135 is the, the KBS-3 method that we have. I'm showing this to show

1136 that it, it's the, actually the canister that will be located
1137 500 meters in the crystalline bedrock, and surrounded with, with
1138 bentonite in galleries. And the underground we need, the kind of
1139 rock we need, which is granite, we need the granite that does
1140 not, is not heavily fractured, homogeneous, and also, that does
1141 not have ores or minerals that would tempt future generations to
1142 mine those.

1143

1144 This is how it will look like in the future, I think in a few
1145 years, 10 years, something, the encapsulation facility. And this
1146 is the work development, I included these slides for your
1147 benefits; you can look at them when you feel to. And these are
1148 all the reports for research that we submit to the government.
1149 You see that each three years, and it's been quite a few along
1150 the years. And it's the only involvement we had with the
1151 government. Our daily work within SKB did not involve at all the
1152 people from the government. It was three, every three years, and
1153 they would ask all stakeholders to study our report on our
1154 research and give them a statement. And they would compile it
1155 and give us directives for our research.

1156

1157 So, the siting, we did the work on research and technical
1158 development. And at one point, it was in the late '70s, we
1159 thought we had, we have to start looking at this bedrock and to
1160 find this granite that's homogeneous, that's not fractured, and
1161 doesn't have, include any ores. And as you see, the green spots
1162 are all spots that are actually, that would be, that would be
1163 valid for, to site a final repository. And you can find them
1164 everywhere. The red ones are not, and the gray ones is actually
1165 a mountain chain that still rising and very young and not
1166 suitable. And it's the same in the south, also, in the island of
1167 Gotland.

1168

1169 And we did general siting studies that have been done but, by
1170 the parallel to the geological survey here, but in Sweden, of
1171 course. And we came in the early '90s to the feasibility
1172 studies. And we start, we started to discuss in the company how
1173 are we going to start this dialogue with communities? We started
1174 by having informal discussions with the communities that already
1175 had nuclear power. And they said to us, very firmly, "Oh no,
1176 you're not coming again. We already have the reactors. So, you
1177 want a place for your final disposal. Go look elsewhere. And
1178 then if you do not succeed, we can talk to you again." So, it

1179 was really a cold hand from the nuclear power communities at
1180 that time. And we were preparing how to start the discussion, or
1181 the dialogue, with the communities in Sweden. And there are 267
1182 communities in Sweden, approximately around 20,000, give and
1183 take, inhabitants, so they're not huge.

1184

1185 At that time, meanwhile, we are thinking about how to start
1186 that, once zealous journalist took that information and run with
1187 it. I don't know how he got that information, that we are going
1188 to start this dialogue, but what he did, actually, he sent a
1189 fax, at that time there were fax, he sent a fax to all these
1190 municipalities asking them, "Do you want to have final
1191 repository on your premises, not talk to SKB, or do you want to
1192 have a final repository?" And of course, you had all these
1193 statements, as some wrote the day after their community as a
1194 nuclear-free zone immediately, and others expressed a positive
1195 attitude towards engaging in dialogue, but the big majority were
1196 silent.

1197

1198 So, we had to start somewhere. So, we'd been rushed out there
1199 because we had to act. So, you don't, you don't always, and this
1200 period between, when you are going to start your dialogue, I

1201 know, not only from my country, but also from many other
1202 programs in the world, is extremely sensitive how you launch
1203 that dialogue. And we are not talking about a proposal, we are
1204 talking about just listening about some information about the
1205 project, and understanding more about what's going to happen in
1206 deciding and all that. But we started in the north, we started
1207 in community of Östhammar. And no, the community of Storuman and
1208 in Mala.

1209

1210 And these communities are very different, in the sense that they
1211 are far up in the north where there are no industries,
1212 absolutely no nuclear, and a lifestyle, outdoorsy style,
1213 lifestyle, with fishing, hunting, and so industry and nuclear
1214 industry was a really strange bird. And starting there, making a
1215 long story short, we started the dialogue with them and meeting
1216 with the citizens of those municipalities. And very, very soon,
1217 there was a divide in those municipalities for the final
1218 repository, against final repository. And the divide could be
1219 even in one family.

1220

1221 And when you come to, when you start siting of such a facility
1222 as a final repository, you actually, all the tensions in

1223 societies come to the surface. You have female, male. We knew
1224 that female are more cautious and more against such a facility.
1225 You have big city, countryside. And all these things come to the
1226 surface and you have to deal with it. Meanwhile, you are at the
1227 same time trying to talk about your project with its challenges
1228 and benefits. So, after three years work out, in the north, with
1229 very, quite difficult conditions, but we still carry those
1230 dialogues. And we've been voted out. They've been, they've been
1231 elections, and they voted further cooperation with SKB in
1232 Storuman with 73%, in Mala with 53%. So we said, "Okay, if you
1233 don't want to engage, we will be going back and thinking about
1234 the next step."

1235

1236 And we really took a few years to decide how to do it. And we
1237 had some rules. From the beginning, and still, for the second
1238 phase, it's consent based. We said safety first. We will not
1239 take a bedrock that's not good just because the community
1240 welcomes us, that's not going to happen. It has to be the right
1241 conditions, safe conditions. But given that, you have to be
1242 accepting it, consenting to, to work with us. And the third
1243 thing is that these communities had a veto. They still have a
1244 veto. So they can work with us, all the steps, and if at some

1245 time they decide they want no longer to be engaged, they can
1246 withdraw. Their veto is freezed once they have asked the
1247 government, when the government asked them before giving us the
1248 permit to construct the final repository. The government asked
1249 them, "Are you for or are you against?" If they say, "We are
1250 for," than that situation with the veto is over. But until that
1251 point, and we talking about 20 years of lots of work with these
1252 municipalities, they can withdraw at any time.

1253

1254 So, we started feasibility studies at the second phase in six
1255 other communities; I was in charge of three of them. And in each
1256 community, we had an office, and we recruit people locally, and
1257 we engage at all levels. And, for instance, in one of the
1258 municipalities that was in my portfolio, municipality of Tierp,
1259 22,000 inhabitants. We talked to 13,000 face to face, from, if
1260 we didn't talk to them more than one hour, less than one hour,
1261 they didn't count. More than one hour, then we count them. So
1262 basically, we talked to each grown up.

1263

1264 And we had interaction with schools, with schools through, for
1265 the younger kids through the teachers, and for the older ones
1266 directly. We had debates with NGOs, NGOs had also, and

1267 communities, they had money from the nuclear fund to engage. So
1268 their participation in the process has been also paid for by the
1269 nuclear fund.

1270

1271 And then another question, how we went along with all the
1272 decisions about how many feasibility studies we should do, how
1273 many site characterization we should do, all these things that
1274 are part of the consent-based have been actually discussed with
1275 the stakeholders as well. And have been this has, had, they have
1276 been also described in our three yearly reports to the
1277 government, "This is what we are going to do," and everybody
1278 could express what they think about that.

1279

1280 So, it was consent-based all the time, but the rules of the
1281 process has, have been also discussed with the people that are
1282 engaged in that process. We decided that we make 5 to 10
1283 feasibility studies, and everybody agreed about that. And we
1284 will make at least two site characterizations, and of these two,
1285 we will choose the last one.

1286

1287 So, what was actually very important in building trust, because
1288 I used to say to my staff, "We are a nuclear waste management

1289 business, but, actually, we are in the trust business," because
1290 this is key, loss of, technology, everybody, at some point,
1291 knows how to do and how to construct a safe final disposal. But
1292 the trust, you have to do it. And it's actually built over time.
1293 You have to be able to talk and explain your project in
1294 understandable way to the publics, and I put the publics with an
1295 "s," even if it's a collective word, because you will be meeting
1296 an extremely non-homogeneous crowd. And then you would hear one
1297 thing and its opposite in the same meeting, and you have still
1298 to meet all people with respect.

1299

1300 And also, this is something we didn't understand in the
1301 beginning, the dimension of the project, they are scientific,
1302 they're social, they are absolutely political, in my country, at
1303 least, and I think in most countries. And they are ethical,
1304 because we had these discussions, and actually the ethical part
1305 of that has been pushed for by the parallel to the Board in
1306 Sweden by then, a lady called Camilla Odhnoff, that was the
1307 president of the Board by the time that started that discussion.
1308 And it was very helpful.

1309

1310 One of these ethical discussions that I was carrying out with
1311 lots of, in lots of workshops, was to have people talking about
1312 our challenge as Swedes. "This is a national challenge instead
1313 of this is your challenge. You are the industry, you produce
1314 that waste, deal with it. I voted no in the '80s for nuclear, so
1315 it's not my business," and it took some time. Nobody, you cannot
1316 hear in Sweden today anybody talking about, "This is your
1317 waste," or, "This has nothing to do with me." It's our waste and
1318 we're dealing with it.

1319

1320 And you have to be also extremely open to the challenges that
1321 you have and the potential impacts, both good and bad, and be
1322 very open about those, because it takes time. And if you're not
1323 upfront with all your challenges, they will find out anyway, and
1324 we'll be losing some trust in that.

1325

1326 And keeping also a positive attitude. I mean, it's been very
1327 hard, and, but it's been also very rewarding to work on that.
1328 Among other things that we did, we had a social research program
1329 for 10 years, where we had the researchers interact with the
1330 communities about what are the questions that they would like
1331 them to really investigate, and do research on. It been

1332 anything, like image and how you can change the image of small
1333 community once you have nuclear waste? Is it a dump, or is it a
1334 high-tech facility? All these questions.

1335

1336 Some of the key factors. I think, in my view, the most important
1337 one is to define the responsibilities and rights of the waste
1338 producers, and explain the role allocated to each stakeholder.
1339 The way one organizes nuclear waste management is key. And I
1340 think, I cannot see a way that would succeed, personally, that
1341 does not link the producers to their responsibility in the
1342 nuclear waste management.

1343

1344 The financing, of course, the responsibilities for financing
1345 and, and the implementation have to be clear, who understand the
1346 importance of trustworthy regulator, how important the, it is
1347 that they are present. Generally, they don't want to be present,
1348 because they think we will be reviewing this, so we don't want
1349 to engage ourselves early. But it's not that they will have to
1350 say, "Oh, SKB's doing the right thing or not," it's explaining
1351 their role in the future reviewing of, once there is an
1352 application to review.

1353

1354 You have to get the public involved very early, as early as
1355 possible, in developing the process. You, you do not come with a
1356 ready-made process and put it on their head as a hat. They have
1357 to be involved in, you know, giving their views. You don't come,
1358 mind you, with a white sheet either, but you have with some, it
1359 come with something that can be enhanced by a, the, a collective
1360 and collaborative effort.

1361

1362 You have to make sure that you go, you have an approach that's
1363 stepwise, adaptive and iterative, you don't get to try it right
1364 from the beginning. So, you have to be ready to change things
1365 when needed.

1366

1367 As I said earlier, be open about the challenges as well as the
1368 advantages of the project in your dialogue with stakeholders,
1369 use your best experts, not communicators, I have to say it,
1370 communicators that can package your, your stuff, but don't send
1371 them out there. You know, you want people that really master
1372 what they're talking about.

1373

1374 It's not for everybody. I have engineers that did not have that
1375 privilege, because they were better at the lab than outside. But

1376 if you have good ones, send them, and expect opposition as well,
1377 and it takes time.

1378

1379 In January 2020, the government decided to give the green light
1380 to construct a fine repository, an effort that personally I
1381 spent 35 years on, and many colleagues of mine over 40, but it's
1382 coming into fruition now and, and probably we'll start in to
1383 build the final repository sometime in '27. So this is a journey
1384 of 40 years actually said in 30 minutes. Thank you.

1385

1386 SIU: Thank you, Saida, very nice. Okay, again, we'll start with
1387 a small Board team. Steve?

1388

1389 BECKER: Steven Becker NWTRB Board member. Thank you, Saida, for
1390 a really excellent presentation, packed with many years of
1391 experience and insight. I was particularly struck by your
1392 comment that, "We are in the trust business." I think that's an
1393 exact quote. It's clear that extensive engagement and building
1394 trust have been absolutely central to Sweden's success. And it
1395 also sounds as though you have had to adapt and revise
1396 engagement efforts more than once. Could you comment on how

1397 important it is to take your time in setting up and carrying out
1398 engagement processes and not rushing that effort?

1399

1400 ENGSTRÖM: Oh, it's extremely important. It's extremely
1401 frustrating because you have to, you sit in and you're doing
1402 some desk work by talking among yourselves, by seeking
1403 information with, important and pivotal organization and
1404 communities to nurture your thoughts, so it takes time, but
1405 without that, you will be stepping with the wrong foot in a
1406 community. So that's, that has been really important.

1407

1408 And also, we tried, when we have, when we had a question that
1409 we, when we landed the question, we didn't take it for granted.
1410 "Oh, this is it. This is the way." We went around and we talked
1411 to safety authorities, mayors of communities, people from the
1412 government, where, when we could reach them, and NGOs, and we
1413 listened, and we went home. And not only once, not only twice,
1414 many times we had to revise and tweak, and then, so, and that
1415 takes time, that takes time, but I think when I heard sometimes
1416 that some organization tried to establish a consent-based
1417 process in one year or two, I know the result, that it will not

1418 be what one would wish for, because it takes time. It's tedious,
1419 it takes time, but it's necessary.

1420

1421 BECKER: I was also struck by your comment about the importance
1422 of scientists and engineers being out there, doing a substantial
1423 amount of the communicating. Could you maybe say a little bit
1424 more about how that process was organized and how you chose such
1425 people and trained them and got them ready to undertake that
1426 important work?

1427

1428 ENGSTRÖM: Yes, we did that, and it was a program on itself. I
1429 was, at that time, I was not only managing the feasibility
1430 studies, but I was in charge also of this dialogue outside the
1431 company. So, we choose, I think it was the president, myself,
1432 and a couple of other people in, in the executive management, we
1433 choose 16 people, 16 experts, and we had two workshops. And if
1434 you know anything about scientists, they don't want to go out
1435 there and talk to lay people. They want to stay and talk to
1436 their colleagues that understand them or, you know, "Just leave
1437 me alone." So, they did not say, "Yay, you want me to go out
1438 there." It was a, "No," and we had to train them.

1439

1440 And we had a program for training. And the one, I can give you
1441 that, as I think Piet Zuidema knows whom I'm talking about,
1442 Allan Hedin, he said no. He was our brilliant scientist, he's a
1443 safety and analyst, and he wouldn't go out there. He was, he's
1444 the one, the brilliant communicator for SKB now, and he has been
1445 for the last 20 years. But it was, actually we had people in,
1446 experts in communication, training them with monitors, with
1447 interviews and, and they became better and better, more
1448 comfortable.

1449

1450 The first time we had him on the news, he was not good. The last
1451 time I saw him on the news, he was excellent. But that's the
1452 time, that's a program that run along their work of scientists
1453 that, and they learn to enjoy it later. Because they could, you
1454 know, give feedback to each other and see that they can, they
1455 progress. And it's been extremely important. Because even when
1456 people listen to you and do not understand, you have safety
1457 analyst and he talks about these complicated features, but
1458 because he master his thing, he can also explain it, and people
1459 understand and trust him because they know this guy knows what
1460 he's talking about, and you gain trust that way. That trust
1461 cannot be given by a communicator that has packaged, packaged

1462 messages. That I know for sure. So, it's a work, even that;
1463 it's a program and it's a work.

1464

1465 BECKER: Thank you.

1466

1467 TYLER: Thank you, Saida. Wonderful presentation. Scott Tyler
1468 from Nuclear Waste Technical Review Board. I, too, had a
1469 question on how do you, how, what was, what were you, how are
1470 you motivating these people, your scientific communicators?
1471 Because it is difficult, none of us are, we all have big egos,
1472 we like to be out there talking, but, we also like to be doing
1473 our work. And was there early on to get acceptance, you know,
1474 was there compensation, was there recognition in your
1475 organization that this work was critical and that they were,
1476 they were seen as, these individuals were seen as incredibly
1477 valuable in what they were doing? Because that's not our usual
1478 capital, I should say, for scientists and engineers.

1479

1480 ENGSTRÖM: Yeah, actually, it was like playing tennis from the
1481 baseline. It's really making them, you go on them once and once
1482 again and once again. And please, just try and, at the end they
1483 say, "Okay, just, I'll have to get her off my back and I'll

1484 try." And once they tried, they hooked, because they want to be
1485 better. And also, you explain to them that, "You will be doing
1486 us a huge favor."

1487

1488 I can talk, I'm a nuclear engineer in nuclear chemistry. I can
1489 talk about safety analysts. I will never be able to do it the
1490 way Allan Hedin does it. And I told him that. "Of course, if you
1491 want to, I go on TV and talk about this half good, I'll, I'm
1492 going to do it. But why? You can do it." So it was more in our
1493 conversations, actually. It was just, of course, career-wise,
1494 these people were compensated by their salaries and things like
1495 that, because they, they're doing very good work for us. But it
1496 was, it took some convincing. But, I think most people, if they
1497 know, if they are safe with the situation, they don't mind, but
1498 you have to help them be safe in this situation.

1499

1500 TYLER: Okay, thanks. And, and, and I'll follow up with a
1501 different question, which, which was something you said in the
1502 beginning, that, that Sweden had a, you had a plan, a roadmap
1503 for nuclear waste from the beginning. But at the same time, you
1504 also had to be flexible to change that.

1505

1506 ENGSTRÖM: Yes.

1507

1508 TYLER: And I'm, I'm just curious, in the context of consent-
1509 based siting, how did you communicate those changes to the
1510 communities that you were engaging with? You know, how was that
1511 trust maintained that we're changing, we're shifting gears a
1512 little bit, we, we've discovered something we, we're not sure
1513 about, now we're going to move this way? How did that progress?

1514

1515 ENGSTRÖM: We do, we did it as in our dialogue. We always made
1516 an update of the program when we meet them. And when we tell
1517 them we, this we've changed because of this and that. And
1518 sometimes they're behind the change. Sometimes they, their
1519 comments have been behind the change. For instance, we did not,
1520 we thought it was something outlandish to finance the opposition
1521 to oppose us from our fund, but we had to listen to that and
1522 accept it. And that was a change we took. So as long as you
1523 explain why you changed your ways, I think people accept that,
1524 and also respect it. Why the plans that we made in the '80s will
1525 be valid 2023? That's not sensible. I mean, we must have learned
1526 something, and there are a couple of decades. So, I think that's
1527 been a, an open conversation with us, open dialogue with us, and

1528 we always update them about the changes, the new things, and we
1529 answer their questions about why those changes.

1530

1531 BECKER: Steven Becker, again, NWTRB Board. So, you mentioned
1532 funding being provided to NGOs, presumably to support full
1533 participation.

1534

1535 ENGSTRÖM: Yes.

1536

1537 BECKER: Was this also done for purposes of capacity building?
1538 And was it done to allow them, for example, to develop
1539 resident expertise related to the process?

1540

1541 ENGSTRÖM: For the NGOs, it actually, it was to make it possible
1542 for them to participate. So, they had, with that money, they had
1543 an office and two people that are hired to, to follow everything
1544 we do. So, they've been on all our workshops, our meetings and
1545 also they've been when we were under the review of our
1546 application, they were opposing us in the environmental court
1547 and all that, and that money was used to that. Engaging the
1548 residents, that was the money we were giving to the municipality
1549 to hire their own experts in different areas. They would hire

1550 geologists, they would hire people in safety, safety analyst,
1551 competence. And they will make them translate, or review, our
1552 reports to them. So, they have a statement from an independent
1553 body, other than safety authority, because they're not engaged
1554 before they have a formal review, and independent from our
1555 experts. So that was very important.

1556

1557 I haven't said anything about the added value, what's in it
1558 money wise for the communities. I can do that when we have the
1559 round table, maybe. Because in Sweden, no money changed hands
1560 before the decision that the government take, because otherwise,
1561 in our country, it would be a bribery. So, no money changed hand
1562 be, between the industry and the communities, under the whole
1563 siting process.

1564

1565 BECKER: Thank you.

1566

1567 SIU: One last question, Brian.

1568

1569 WOODS: Brian Woods, Board member. Thank you, Saida, for a
1570 wonderful presentation. I have a question around, you said one
1571 of your results that I think you're working towards is turning

1572 national challenge into local interest to contribute. And I was
1573 kind of curious out of all the things you've done over the
1574 years, what do you think was really the most important thing
1575 that has been most impactful on turning that national interest
1576 into local interest?

1577

1578 ENGSTRÖM: Yes. I think what we did, it wasn't, it was not one
1579 single event. It was, I talked about the 10 years that we had,
1580 involving priests and involving mayors and organizations talking
1581 about ethics. Well, in one of the meetings, for instance, in the
1582 early days, one of the ladies, a countess, she just rose to her
1583 feet and she said, "Why don't you send it to the Sahara in
1584 Africa?" You, later on, nobody would even come near such a
1585 comment, because we said, "We have the waste, we can't export
1586 it, we can't sublimit, it's here. So there is two,
1587 alternatives. We start to take care of it, or we leave all the
1588 burden to our children." And it was a debate of 10 years with,
1589 the Board helped us a lot.

1590

1591 We had a book written about the ethics that the Board had
1592 actually written and that has been discussed in all these
1593 seminars, many of them, in all the candidate municipalities. And

1594 at the end of the day, one day, you just found the discussion
1595 going in terms of "Our waste, our solution." So, it took some
1596 time. It really took some time. And this is that we have to take
1597 care of the waste now, not wait, not in 40 years, not in 100
1598 years. This is something that even the people that do not like
1599 nuclear at all, are agreeing upon in Sweden today. So, it was a
1600 journey with that too.

1601

1602 SIU: Sorry, we're a little bit over time. But thank you very
1603 much, Saida. Very nice.

1604

1605 ENGSTRÖM: You're welcome.

1606

1607 SIU: At this point we'll have a break. We're scheduled to
1608 start up again at 9:50. Maybe we start a couple minutes after
1609 that, but please come back. Okay.

1610

1611 SIU: Testing. Okay. If we could get started, please. Okay, our
1612 next speaker is Piet Zuidema from Switzerland.

1613

1614 ZUIDEMA: Okay, so thank you very much for inviting me here to
1615 the US to talk about experiences in Switzerland. I should say,

1616 at the moment, I'm retired, that's why I'm a so-called
1617 consultant. But I was for many, many years, the Director for
1618 Science and Technology at Nagra, so this is a waste management
1619 organization. And I was also heavily involved in the first two
1620 stages of site selection.

1621

1622 Okay, just very quickly, nuclear power is important. It started
1623 pretty early on; the first power plant went online in 1969. It
1624 produces about between 30 to 40% of electricity in Switzerland
1625 and the remainder is hydropower. Well, the starting point, you
1626 know, the Swiss utilities at that time, they wanted to be sure
1627 that fuel will be available and they thought it will be advising
1628 to recycle it. So, we started to see processing. And at that
1629 time, that was a commercial thing, so they thought it, the fuel
1630 would go to France and the UK. But then, suddenly, it became
1631 clear that this becomes a political issue, because there needs
1632 to be some inter-governmental agreements that this waste
1633 probably comes back. And then the government said, "Okay, we
1634 have to do something." The utilities knew that as well. And
1635 together with us, in Nagra, we developed the concept. The
1636 government took the decision in 1978 that we should take a
1637 stepwise approach, and the first step would be the demonstration

1638 of disposal feasibility based on a real model site, so with real
1639 data, and to demonstrate that was a need to continue with
1640 nuclear power.

1641

1642 So, that was the start of the technical program, and the
1643 milestone was set to be 1985, by then we should demonstrate
1644 disposal feasibility. Okay, and actually, our program, then,
1645 finally fell into two phases. That second phase was initially
1646 not foreseen, but I will come back to that in a second. But I
1647 think it's important, we are a different animal than you are,
1648 and that is, because of our specific situation with respect to
1649 plate tectonics. You know, we are exposed to the Arctic, the
1650 Arctic indent of the African plate that pushes it to the side of
1651 Switzerland, and inside of Central Europe. That's the reason why
1652 we have these nice Alps. The North, we have a Eurasian Plate.
1653 And this situation leads to a very special geology. It's
1654 complex.

1655

1656 So, you see on the right hand, on the top, again, this similar
1657 map, so pushing from the south, and the lower graph, below, on
1658 the left, you see, on the right-hand side the south, on the
1659 left-hand side the north, and pushes up there, that means that

1660 the Alps go up, and you'll see they're also cross-section with
1661 uplift rates, so the Alps, they have, still today, significant
1662 uplift rates, one millimeter or more per year, so over a million
1663 years, that's 1,000 meters, and you can imagine, no way that you
1664 build a repository there.

1665

1666 And that has the consequence that all the positive,
1667 possibilities for high-level based are in the northern part of
1668 Switzerland. The other thing is, you know, this pushing means
1669 that a lot of sediments that were originally hundreds of
1670 kilometers further down in the south were pushed to the north,
1671 it was one put on the other, so rather complex, then we have
1672 erosion, et cetera. And that means we have a broad range of host
1673 rocks, but because everything dips to the south, if you go a bit
1674 further to the south, most of these host rocks are too deep; you
1675 cannot use them. So, in that sense, in contrast to what we heard
1676 from Sweden and Finland, Sweden and Canada, we have limited
1677 possibilities for siting.

1678

1679 And already in 1978 crystalline basement was one of the options
1680 you see here, Switzerland, so it was really at the northern
1681 edge. And at the same time, also clay was identified. For

1682 several reasons one said, "Okay, let's start with crystalline,
1683 because all the famous professors all said, "Well, this
1684 crystalline is nice, even let's have a look there. Sweden has
1685 shown that it works in crystalline, so let's have a look at
1686 crystalline." We started the serious drilling at that time;
1687 everything was fine. We also immediately start to hands on this
1688 rock laboratories. We participated also in the Swedish one, in
1689 the Stripa mine, but we wanted to have our own, and we really
1690 started some serious work.

1691

1692 But then we had a surprise. And what happened is that where we
1693 wanted to see crystalline, there was no crystalline. And
1694 actually, we had first done some geophysical investigations, and
1695 on these geophysical investigations, we nicely saw the overlying
1696 sediments. And below that we saw a lot, what I would call noise.
1697 You couldn't really see what was there. And we thought, okay, we
1698 will have crystalline there, and there is some noise in this
1699 crystalline, fine. And we started to drill in some of the bore
1700 holes. We found crystalline, and in the others we didn't find
1701 any crystalline.

1702

1703 And now you'll see our findings. So, it's on the right hand,
1704 you'll see again, Switzerland, so the northern part, and this
1705 scheme below is cross section from north to south. So, you'll
1706 see in this pinky color below that would be the crystalline, and
1707 in the middle, we have a huge part filled with so-called permo-
1708 carboniferous sediments, so no crystalline. So, our
1709 possibilities to site repository in crystalline were, shrank
1710 massively. So, there was not that much crystalline left for a
1711 high-level waste repository.

1712

1713 We came to the conclusion that the safely positive would be, in
1714 principle feasible, that was also accepted by the government.
1715 But it was clear that, actually, you know, siting was rather
1716 limited. So that's the first experience made. Fieldwork can lead
1717 to surprises. And I'm also sure that can happen, for example,
1718 here in the US, so you better make sure that you have a good
1719 understanding about the geological information, that you know
1720 what are feasible things. We heard it also today from other
1721 sites, you have to be able to say to the people that get
1722 involved, if something is not possible. In our case, it turned
1723 out that good "exploreability." So, you can say visibility of
1724 geology by geophysics is very important. It's probably less

1725 important in other countries, but for Switzerland, this was very
1726 crucial.

1727

1728 Okay, well, we had other options, I showed it initially on, for
1729 example, this Opalinus Clay. So, we went a bit more to the
1730 south, and then the things come into, to the right depth level,
1731 so there we have our Opalinus Clay. We did, then, in an
1732 interaction with our stakeholders, also, especially this
1733 government bodies, decide where we should continue. For
1734 geological reasons, we then had chosen a siting region called
1735 Zürcher Weinland, that we did to this Swedish seismics, and you
1736 see here on the top seismics, and you see really nice signals,
1737 really nice lines, so here you have good visibility. And then
1738 these things that you see on seismics, you make a borehole, you
1739 see it on the right-hand side, and then you exactly know each
1740 layer, what rock it is, what it's properties are, and is, that
1741 we had a real good understanding.

1742

1743 Also, here, again, we had our own rock laboratory. Initially, it
1744 was managed by Austin [ph], later on it was decided for societal
1745 reasons to have the local state running this rock laboratory to
1746 have independence. And that's something that will come later on,

1747 it's really important that one had placed the different roles
1748 that are there. But anyway, these underground research
1749 laboratories were in Switzerland of crucial importance to really
1750 develop our scientific basis.

1751

1752 Okay, then we had done that work, our government was happy with
1753 what we found in this, in this Opalinus Clay, and they said,
1754 "Yes, definitely demonstration feasibility that you have
1755 demonstrated this disposal feasibility fine." We then, at the
1756 same time, said, "Look, we had looked at the site; it was really
1757 good." So, the regulator agreed with that. So, we said,
1758 "Okay, let's continue here. We think it's a good site, so we
1759 should go on," but that was not accepted. What's the reason for
1760 that? In parallel to our high-level waste program, we also had a
1761 program of siting a geological repository for low and
1762 intermediate-level waste, going from hundreds potential sites to
1763 20 sites, to three, then add another one, so we had four sites.
1764 These four sites were investigated in quite some depth. You
1765 know, we made an evaluation of that, that evaluation was also
1766 reviewed by external parties, also with looking more at policy
1767 things, and everybody agreed, "Okay, we should choose this site
1768 called Wellenberg." We made a license application. The regulator

1769 was happy with it, he said, "Yes, this is a good site." But then
1770 something happened. It started very small, some protests, you
1771 initially it looked, people were in favor, but then suddenly, it
1772 started, as it was said, "Today already wants."

1773

1774 Somehow, this repository created discussions in families. It was
1775 a seeding point for discussions and they were growing and
1776 growing. And it was very interesting, because nobody really took
1777 this process into his hands; we were the applicant, but there
1778 was nobody else that had this process under control. So, it grew
1779 out of control and we had to abandon that project.

1780

1781 Okay, and then there were some real interesting recommendations.
1782 So, disposal projects are for society, different than other
1783 industry projects. For several reasons, novel, nuclear creates
1784 fears, et cetera, so slow progress and failure possible. And it
1785 was very clear, in our case, we need a different approach. It's
1786 not an Nagra issue, it's a national issue. It's very important.
1787 Up to then, we were everything. We were the proponent, we were
1788 the process organizer, we were the contact person, we were
1789 everything. Nobody else was there, and that was recognized,
1790 that's not the way to go.

1791

1792 So, it was recognized that this also is an issue of national
1793 importance and broad public support is essential, and this
1794 requires a specific site selection process. And that's where
1795 then the second part started. So, we had all the science done,
1796 but it was not enough. We had to restart it again. And I go now
1797 into this in a bit more detail.

1798

1799 So, it was recognized that the geological repository is an
1800 infrastructure of national importance. So, it's not anymore
1801 Nagra alone, but Nagra is there as an expert in a broader
1802 framework. And actually, for infrastructures of national
1803 importance, we have a different legal conditions in Switzerland,
1804 there is a special land use legislation, and that is very
1805 important. So, it's part of the federal government offices and
1806 not of the province offices. And there is, are some rules how to
1807 do it. So first, you have to define the concept that defines the
1808 process, the roles, the criteria, and then it's a three-stage,
1809 stage process to come to some conclusions.

1810

1811 And this sectoral plan process is also used for other national,
1812 infrastructure of national importance, for example, traffic,

1813 military, high voltage power lines, agriculture, et cetera. So,
1814 it was recognized, we are, in a way a similar animal as others,
1815 and it needs special attention.

1816

1817 Okay, So, additionally, to that, it was recognized that we need
1818 a waste management program, or the government recognize that, to
1819 keep track of progress. And it's the same as in Sweden, about
1820 every three years, about every five years, we have to give it to
1821 the government. It's broadly reviewed. Normally we get an
1822 approval; there's open issues that have to be addressed. Then
1823 the concept was developed, and for that, and I'll come to that
1824 in a second, a process owner was put in place. The process owner
1825 only has to organize and make sure that people behave. So
1826 already the concept was developed in cooperation with all
1827 stakeholders. Switzerland is small, you know, eight million
1828 inhabitants. So, we know not each other, but we know roughly, so
1829 it was possible to engage with all key stakeholders, lots of
1830 working groups, working shops, consultation, et cetera. And then
1831 finally, we got that. That concept is very important. And it's
1832 very important that it was developed together, not only given
1833 for consultation, it was developed together in face-to-face
1834 meetings.

1835

1836 Here you see what it is like. I'm not going to go into much
1837 detail here. You will see it later on. Two things, starting
1838 point, wide map of Switzerland, everything is possible. Second
1839 point, first priority to safety. And that means also the
1840 criteria are very important; I'm not going to go and read it
1841 down. So, in that sectoral plan, certain criteria were defined
1842 to give Nagra flexibility. It was clear that these criteria are,
1843 are informed by indicators, so we developed 49 indicators to
1844 inform this criteria.

1845

1846 Here, you will see the organization. In the middle, you have the
1847 process owner is the Federal Office of Energy. He is neutral. He
1848 has no stakes whatsoever. He has only to make sure that the
1849 process is run properly. The process owner reports to his
1850 ministry, to the federal government, and the parliament. Below,
1851 we have the two professionals, the implementer and the
1852 regulators. And then, at the site, you have the formal entities
1853 with elected officials from the content, so that are the states
1854 or provinces, the municipalities and the neighboring countries.
1855

1856 And on the right-hand side, you have the more loosely organized
1857 entities, and they have delegated members. So, this is all the
1858 people that are involved in the site selection with clearly
1859 defined, defined roles and responsibilities and clearly defined
1860 information.

1861

1862 In this concept, it's defined, these roles and responsibilities.
1863 We did that together. So, 15 entities, they know what they have
1864 to do. And it's broad enough that you have some flexibility, but
1865 it's also very clear what the people have to do.

1866

1867 Okay, so again, our concept defined safety, and geology is
1868 important for safety. So, geology defines the site. It's not,
1869 "Do I want to have it or not," it's geology that defines the
1870 site. But the surface infrastructure, that's done together with
1871 the siting regions. So very clear, site due to geology, surface
1872 infrastructure, siting region.

1873

1874 We had some delays in the early days and that allowed us to
1875 build up all the knowledge and that allowed us to very quickly
1876 do the work screening of Switzerland. So, we came up with six
1877 siting regions, three of them for high-level waste, and they

1878 were developed in a systematic manner, very traceable. So people
1879 really could see why these and not others, and that's very
1880 important. So, it, Swiss geology discriminates, so you really
1881 see why here and not there.

1882

1883 Okay, then the announcement of this, and that's now very
1884 important. The announcement was organized by the process owner.
1885 And you'll see here, see here, three gentlemen, that are the
1886 governors of the affected cantons. They were up from there when
1887 the site was announced. And they were there to say,
1888 "We know that we now have to face the problem, or the issue,
1889 that repository could come into our state. We take that serious,
1890 we make sure that these things are very well checked, and that
1891 no quick decision will be made, and we take, make sure that
1892 everything goes right." But with sitting in the front, they take
1893 also part of the responsibility to solve a Swiss problem, and we
1894 were there then make the technical explanations, but you see,
1895 others are also part of the overall problem.

1896

1897 So, this shows that the interaction of the different
1898 stakeholders with the public, that has to happen with clearly
1899 defined roles. And here is one very important thing, all of the

1900 stakeholders had to learn it's not only talking, it's also to
1901 listen, if you interact with the public.

1902

1903 Okay, then because people knew it comes, then so-called regional
1904 participation was organized. Again, that was done jointly,
1905 together with the potential victims, because the regions were on
1906 the table. And so, when it organized so-called regional
1907 conferences, I'm not going to go into detail, but that means it
1908 was the same in all the different regions. And I just can say
1909 this is very important for us that the rules were there so that
1910 the communities were not left alone. They had some framework to
1911 actually operate in and they were then grateful that they had
1912 some help, that they could see, okay, we can run it like that.

1913

1914 Okay, then the government did decide on these siting regions
1915 based on very broad consultation. So, through the consultation,
1916 you have something, like signals of consent, no formal consent,
1917 but through the consultation that is there. And then the
1918 starting point, that through the rules defined it was very clear
1919 which communities would be in, which were out. I just can say,
1920 in our case, we had 40 siting regions, we had over 200
1921 communities to engage with. And you see these regional

1922 conferences at work, they go into the field with us, they did
1923 two studies, et cetera. And then, very important, we enabled
1924 them to form their own opinion by giving them the instruments.
1925 This is a simplified geographical information system, and once
1926 these people got an understanding of that, the regional
1927 conferences started to, really to work because they now saw the
1928 problem, they were able to form their own opinion. So, it's
1929 really you have to empower them to understand the topic and to
1930 work on that.

1931

1932 We then illustrated what such things would mean that they could
1933 form their opinion. And now something very important, already
1934 very upfront, and periodically, again, social, economic,
1935 ecological impact studies were made. And they were very
1936 important, because there was a lot of misjudgment; people
1937 overestimated the impact of the benefits, but also of the
1938 drawbacks. And I think this is very important, because it's not
1939 obvious from the beginning on, but in Switzerland, it turned out
1940 the effects are not as big as expected. And what was also very
1941 important to see, the differences of impact for the different
1942 regions was rather small.

1943

1944 Okay, so again, experience. This evaluation of social, economic,
1945 ecological impact is important. It has to be realistic and
1946 transparent. This, I call it, long-term benefits, not the short
1947 fire and then it's gone.

1948

1949 Okay, surface facilities, you know, we came with 20 proposals,
1950 then we had this communication, lots of things were on the
1951 table. But finally, an additional 13 proposals were evaluated in
1952 great depth, and finally, each region made its choice. And we
1953 could take over their choice in full agreement, because they
1954 were really educated that they could do a reasonable job. So we
1955 actually took their proposals.

1956

1957 Now, a few concluding remarks. The societal process, it's, in
1958 Switzerland, like a meandering river. It doesn't take the direct
1959 pass, it goes more slowly than expected, sometimes dramatically
1960 slowly, slower, but we all agreed, the process owner, as long as
1961 it stays is in certain bounds, that's acceptable.

1962

1963 So, working successfully together is possible; you have to give
1964 the people some support. One has to say, for these communities,
1965 it's difficult, it's difficult, it's difficult, because they are

1966 heterogeneous, and to keep that on track, it's extremely
1967 difficult.

1968

1969 Now, one can say, a next decision, so from six we went now to
1970 three. Fieldwork was done, again, a real opportunity to engage
1971 with the communities, with people, you go on people's land, you
1972 have to talk to them. And here, it's very important that you do
1973 that, this, in a good manner. The same is true for boreholes.
1974 Wonderful opportunity for face-to-face contacts. And again,
1975 fieldwork, it's an opportunity to make contacts, send your
1976 people out, and then you immediately know what people are
1977 thinking and how it goes.

1978

1979 Okay, the endpoint, so as you have heard, Switzerland has
1980 decided to go for a repository, a so-called combined repository,
1981 so all these wastes go into one repository, region Nördlich
1982 Lägern last year, and the general license application, so the
1983 size, the site license will be submitted next year.

1984

1985 Here again, very important in our case, it's really important to
1986 have convincing geological arguments, why here and not there.
1987 This is the whole list of experiences made. I'm not going to

1988 read it through again, you can read it yourself. And I will just
1989 say here again, you'll see the whole overall program. So, you
1990 heard we started in the early '80s, and it, until we have the
1991 site license, it will to, be 2030, so it took us 50 years. And
1992 in that sense, I think consent-based, consent-based siting in
1993 less than 10, 20 years is very, very, very ambitious. Not for US
1994 DOE or the Board, but very hard for the communities there.

1995

1996 The last comments, commitment, national commitment, very
1997 important, clarity and stepwise approach, correct professional
1998 behavior of all stakeholders, project of high quality, social,
1999 economic or ecological impact, put it into context, provide time
2000 and information that people get an understanding, interaction
2001 with the public at equal level, including listening, that the
2002 public becomes familiar with the organization and is able to
2003 contribute to the project. So thank you for listening to my
2004 presentation.

2005

2006 SIU: Thank you, Piet. And you actually brought us back on
2007 schedule, I think. Okay. We'll start off with questions. I'll,
2008 just to change order, Scott.

2009

2010 TYLER: Sure. Thank you, Pete. Thank you very much. Scott Tyler
2011 from the Board. I had a,... I'm struck so far, and perhaps not
2012 surprised, so far, all three of our presentations have
2013 documented the false starts that these programs have had. And I
2014 think that's,... it's going to be a common theme in all of our
2015 programs; everyone has had a significant false start. But just
2016 from a standpoint of understanding for the Board and the public,
2017 and this is a hard question, but could you give me a sense of
2018 over this timeframe, how much of the resources of Nagra was
2019 spent on the consent side, the public interaction side, versus
2020 the technical side, just in percentages, and maybe how that's,
2021 how that changed in time.

2022

2023 ZUIDEMA: Well, I would say in the, it was always realized that
2024 you have to do things through personal contacts, that was always
2025 there, but I would say in the early days, probably 20% of that
2026 was devoted to this. And in later times, that went for sure up
2027 to 30 to 40%. And that also means that you sometimes, in our
2028 case, at least, that you look at things that are upfront from
2029 the scientific point of view, you would say, "Why should we look
2030 at that?" But we knew, we knew we have to do that because people
2031 want that we do a proper job. They want that we really look at

2032 all the things that we can full heartedly say, "Yes, it's here
2033 and not there. It's not just a guess, but it's solid work."
2034 In, in Switzerland, it's interesting, you know, the, you should
2035 know, in Switzerland, we have to vote, let's say 10 times a
2036 year. So Swiss citizens are used to inform themselves, and so
2037 they want to know. And also, in the votes, they're happy to take
2038 very unpopular decisions in voting, increase the taxes, and they
2039 say, "Yes," because they understand it. And so for us, we had,
2040 in that sense, to do quite a lot of work where I would say,
2041 "Well, we would have known beforehand," but no shortcuts. The
2042 public expects that we do solid work, and that they really
2043 understand it. And that took quite a lot of effort. Money wise,
2044 it's, if I say it is percentage, it's not only money, it's also,
2045 you know, management concern, time, and probably, I would say,
2046 over average close to 40%. So time and management concern.

2047

2048 TYLER: So, a significant component, very significant.

2049

2050 ZUIDEMA: Yes.

2051

2052 TYLER: Thank you. Yeah.

2053

2054 ZUIDEMA: I mean, this conventional construction things you just
2055 go and build. And this is rather different here.

2056

2057 TYLER: Thank you.

2058

2059 BECKER: Steven Becker board member. Thanks, Piet, for an
2060 excellent presentation. So, you emphasized the value of direct
2061 face-to-face contact with people in the Swiss process. And
2062 thinking back to the previous presentation by Saida, she talked
2063 about having scientists and engineers do a lot of the
2064 communicating. Did you have a similar emphasis or a similar
2065 approach in Switzerland?

2066

2067 ZUIDEMA: Yes. And, and it's clear. In our case, just the public
2068 said, "We don't want to talk to the, the communication
2069 department. We want to talk to the people that do the work." And
2070 it's really, it, they want to see the faces. It's they, the
2071 content is also important, but they want to see the faces, and
2072 probably a small thing. You know, we did do something you say,
2073 "Really crazy." For the seismic surveys, we had to contact
2074 about, order of magnitude, 10,000 landowners. No letters, no
2075 emails. [Knocking sound] "I'm here, can I talk to you?" So we

2076 went from one door to the next, that people saw us. And you can
2077 say, "Crazy, these Swiss guys," and probably it's crazy, but in
2078 Switzerland, it worked, because they saw these people and they
2079 saw, "Ah, they are reasonable. And if I showed them here is my
2080 rose garden, I don't want a geophone in my rose garden, they
2081 even understand that." And so that helped. And we did actually
2082 do the same. So we had, you know, at public places, a lot of
2083 people, we were there to stand and we did talk to people.

2084

2085 So Swiss people, you know, shaking hands, that's the most
2086 important thing, that you see the people and you have trust in
2087 them. So, I would say in our case, and I think Saida said the
2088 same, the importance of the persons, don't underestimate that.
2089 It's, and no theater. Authentic. It's really important that they
2090 feel comfortable this is what they say, if they learn it out,
2091 then that doesn't work.

2092

2093 BECKER: Thank you.

2094

2095 TYLER: Just one quick question, Piet, on communicating the
2096 social and economic impacts and the benefits to the communities
2097 and to the cantons, in the Swiss experience who, what

2098 organization was responsible for that? Was that the process
2099 owner? Or was that Nagra?

2100

2101 ZUIDEMA: No, actually, even some of the cantons started this,
2102 commissioning their own studies. So, it's us that delivered the
2103 basic data, but then it were normally, you know, people that are
2104 specialists in that. So not our studies, very important. We only
2105 delivered the data, and they were also, in that sense,
2106 challenged, so a lot of discussion if they were correct or not.
2107 And fortunately enough, in Switzerland, there were some most,
2108 methodologies, for example, to, how to calculate economic
2109 impact. So it was done neutrally. And I think that was one of
2110 the things, you're, in the early days, everything was Nagra. We
2111 did politics, we went to the state governors. We were process
2112 only, we were everything. And that's just not credible. You have
2113 to have the different roles, at least in Switzerland one has to
2114 see.

2115

2116 And probably also something about safety might be interesting
2117 for you to hear. So, you know, we have the formal one. So, you
2118 have the regulator and us, but then, you know, the cantons also
2119 had their safety committee, and then they had the specialized

2120 committee, et cetera. So overall, our work was charged by, I
2121 think it were about seven different safety groups, and they all
2122 formed their opinion if our work was correct. And so, you can
2123 say, in that sense, there were a lot of different inputs on what
2124 we had done. And that all went into this consultation by the
2125 federal government. And happily enough, we worked good enough
2126 that everybody got why here not there. So, there was more or
2127 less obvious agreement on what we had proposed. So, no voting,
2128 but indirectly voting through specialist groups.

2129

2130 SIU: Bret, do you, we have anything from Lee?

2131

2132 LESLIE: No.

2133

2134 SIU: Steve, did you want to --

2135

2136 BECKER: Sure, if we have time. Steve Becker, again, Board. So,
2137 you talked about some tools that were provided to communities,
2138 to help them form their own opinions of the proposals. What
2139 other sorts of things were done in the way of tools or resources
2140 to facilitate the participation of communities, NGOs, and the
2141 public?

2142

2143 ZUIDEMA: Well, the first thing is you can say also in a way
2144 training, you know, and there I can, again, say our to rock
2145 laboratories we really good. So, we made tours for everybody
2146 that wanted, you know, "Drive you up to our rock laboratory,
2147 have discussions and all these things." We went to our, you
2148 know, centralized interim storage facilities where you also have
2149 waste treatments, et cetera, so that people start to learn that.
2150 Then we offered courses.

2151

2152 And then just going to these communities, you know, in the years
2153 where this was intense, I was more or less, every second or
2154 third night, I was in a community. And, and my colleagues as
2155 well, you know, 200 communities, each community wants to see you
2156 three, four times, so you have thousand nights. And that we did,
2157 and that was really good. And it's interesting, you know, in
2158 these communities you have, well, let's just not think about, I
2159 should say, but we, what was done by the process owner, to make
2160 sure that we actually reflect society. So, we did do something
2161 differently than do DOE. We did not send out people to comment,
2162 but one went to these people, not us, but somebody independent
2163 to get, you know, a representative view. And that was also done

2164 with the training, that one really try to make sure that you
2165 have the representative participation.

2166

2167 So, this regional conference, it was not only you sign up, and I
2168 want to go, but it was also sometimes one was searching to, for
2169 example, for farmers, farmers want to do farming and not help
2170 us. But we then made really sure that we got some farmers
2171 beforehand, when they can start, you know, to be really sure
2172 that you have a representative spectrum of society, because
2173 normally, you only hear the people that want to shout, and all
2174 others are not there. And that only a process owner can do, you
2175 know, for that you need a neutral processor.

2176

2177 BECKER: Thank you.

2178

2179 SIU: Thanks again, Piet. Very nice. Our next speaker is Dan
2180 Bullen.

2181

2182 BULLEN: So, as I start, I kind of feel at a disadvantage,
2183 because I don't have any successes that I'm going to be able to
2184 tell you about with respect to the United States nuclear waste

2185 management siting efforts. But I'll give you a little bit of
2186 background.

2187

2188 As mentioned previously, I was a member of the Board from 1997
2189 to 2004. And during that time, I got to do the international
2190 travel, I got to see the sites in the US. And I found it to be
2191 very interesting that a lot of the questions that we asked 30
2192 years ago, are still the questions that you're asking now 26
2193 years ago, I guess.

2194

2195 So first, a disclaimer, I am a federal employee. I work for the
2196 Defense Nuclear Facilities Safety Board. My views expressed
2197 today are only my views, there are no official support or
2198 endorsement by my employer, or the Defense Nuclear Facilities
2199 Safety Board, or the US government, and it's not intended or
2200 should be inferred. So that being said, my lawyers are happy,
2201 and we can now continue.

2202

2203 So just a brief outline of what I'd like to talk about today.
2204 When Dr. Leslie approached me about doing this, and I actually
2205 talked to Dan Ogg about this, also, I want to give a little bit
2206 of a background about public participation, or lack thereof, in

2207 the previous siting processes that were done. And I'll highlight
2208 a few, certainly not all of them, but I'll talk a little bit
2209 about early siting processes in United States. I'll talk about
2210 the Yucca Mountain project, I'll talk a little bit about the
2211 Waste Isolation Pilot Plant, and I'll spend some time on
2212 monitored retrievable storage sites. We've had a number of
2213 programs where we've tried to get involvement with local
2214 communities associated with interim storage of spent nuclear
2215 fuel.

2216

2217 And then I'm going to spend some time, probably too much, on a
2218 case study, which was my interactions with the Office of the
2219 Nuclear Waste Negotiator in the early 1990s. And we'll talk a
2220 little bit about the Feasibility Study grants project that
2221 happened actually in my wife's hometown, in Wayne County, Iowa,
2222 some timeline of events, and the outcome. And then I'll
2223 summarize with a little bit of a lessons learned associated with
2224 what I've seen, both in the federal process to cite both the
2225 high-level waste repository and interim storage facilities, but
2226 then also, just the lessons learned associated with my efforts
2227 with a Nuclear Waste Negotiator.

2228

2229 So just doing a little bit of a history survey here with the
2230 past siting efforts, you can go all the way back to the 1950s
2231 when the National Academy of Sciences did their study and
2232 decided that deep geologic disposal was the way to dispose of
2233 spent nuclear fuel and high-level waste. One of the early sites
2234 that was identified was Lyons, Kansas, and this site was
2235 actually a salt, a bedded salt site, that had been investigated,
2236 not too excessively, but it actually was terminated for two
2237 reasons. In addition to a strong local opposition, they didn't
2238 do a very good job of the geologic characterization that my two
2239 previous speakers talked about. And were quick to be pointed out
2240 by the opposition that there were many unmapped well sites in
2241 the area, and unmapped well sites mean holes in your repository,
2242 or your geology, which are not good things associated with
2243 isolation of high-level waste in a geologic repository.

2244

2245 With respect to the Yucca Mountain site, the Nuclear Waste
2246 Policy Act, actually was the first, well was the enabling
2247 legislation that identified that we're going to do geologic
2248 disposal, set up the Office of Civilian Radioactive Waste
2249 Management, identified potential sites that were to be studied.
2250 And then, essentially, after that, it's in limbo. So, we'll talk

2251 a little bit about what that means a little bit later. And in
2252 addition to that, I'm going to talk about the Waste Isolation
2253 Pilot Plant, which is an operating transuranic waste disposal
2254 facility. Actually, my agency does have oversight over the WIPP
2255 site. So, I've been there a number of times, and have some
2256 interesting understanding about how the licensing process,
2257 excuse me, certification process worked with respect to that.

2258

2259 Talking about monitored retrievable storage, I want to talk a
2260 little bit about the Nuclear Waste Policy Amendments Act, and
2261 some of the issues that were identified there. And there were
2262 efforts by the Mescalero Apache tribe, the Skull Mountain, Skull
2263 Valley Band of the Goshutes in Utah. And again, the Fort
2264 McDermitt Paiute Shoshone Indian Tribe in Nevada, all worked
2265 through the process and got to a certain phase of license or,
2266 excuse me, of understanding of how the process works. And then
2267 again, there was the commercial, consolidated interim storage
2268 facilities, and none of which are operating. So the private fuel
2269 storage facility licensed in Utah, again, it's the Skull Valley
2270 Band of the Goshutes that did that, interim storage, storage
2271 partners in Texas, and, which was licensed, and then the Holtec
2272 facility in New Mexico.

2273

2274 So, going back to Yucca Mountain, as you all know, since this
2275 agency was actually established by the Nuclear Waste Policy
2276 Amendments Act, the Nuclear Waste Act, Policy Act established
2277 the Office of Civilian Radioactive Waste Management, and OCRWM
2278 actually conducted a national search, not unlike the blank map
2279 that was shown by my predecessors, and eventually identified
2280 nine sites to be studied in six different states. You'll recall
2281 that President Ronald Reagan approved three of these sites for a
2282 candidate list. Those three sites were a Deaf Smith County,
2283 Texas, which was a salt site, and it was actually a salt diapir,
2284 the Hanford Site which was a basalt site, and Yucca Mountain,
2285 which was a tuff site, volcanic tuff site.

2286

2287 In December of 1987, Congress amended the Nuclear Waste Policy
2288 Act, and directed that only the Yucca Mountain site be studied.
2289 If the Yucca Mountain site was found to be unsuitable, then you
2290 would move on to the next site. For those of you that live in
2291 the... in Nevada, I'll point to Bill Boyle in the back, I'm still
2292 it's surely remembered as the "Screw Nevada Bill" that was
2293 passed in, just before Christmas of 1987.

2294

2295 So again, if, if Yucca Mountain was found unsuitable, other, you
2296 stop immediately. And in each of these sites, there was
2297 essentially zero participation by the public in the early part
2298 of the Yucca Mountain project. This was a typical example of
2299 government "Decide, Announce, Defend" capability in the siting
2300 process. So also, also called the "DAD" process, if you will.

2301

2302 So, moving on to an effort to site and, a transuranic waste
2303 facility, the Waste Isolation Pilot Plant actually was started
2304 by the Atomic Energy Commission in 1974. And they chose an
2305 ancient salt bed, about 26 miles from Carlsbad, for an
2306 exploratory studies facility, or an underground lab, to search
2307 for underground radioactive waste repository sites. In 1979,
2308 Congress authorized WIPP as a research and development facility
2309 to demonstrate the safe disposal of waste that came from defense
2310 activities, not regulated by the US Nuclear Regulatory
2311 Commission.

2312

2313 In 1991, the New Mexico Attorney General filed a federal lawsuit
2314 against the DOE and the Department of Interior, regarding the
2315 withdrawal of the land for use as the WIPP test phase, alleging
2316 that the WIPP lacked the interim status under the Resource

2317 Conservation and Recovery Act, that would allow WIPP to be
2318 treated as a hazardous waste facility if the permit were issued.

2319

2320 So, I'm getting into the little nuances there, but recognize
2321 that the Environmental Protection Agency is the sort of
2322 certifying agency for WIPP, not the Nuclear Regulatory
2323 Commission.

2324

2325 So, in 1986, President Clinton signed legislation that amended
2326 the WIPP Land Withdrawal Act, and essentially eliminated the
2327 test phase language. Now, this is important, because then it
2328 allows them to proceed with actually an operating facility, not
2329 a test facility. So, DOE issued a record of decision on the
2330 second Supplemental Environmental Impact Statement to dispose of
2331 TRU waste at WIPP. And then after eight public hearings around
2332 the country, okay? So, he asked about public participation.
2333 There were eight public hearings around the country, only one of
2334 which was held in New Mexico.

2335

2336 EPA then certified WIPP meets all of the applicable federal
2337 radioactive waste disposal regulations. At the time, it was 40
2338 CFR 191. Too much detail, I apologize to the audience right

2339 here. So, in 1998, the US EPA did certify WIPP for safe, long-
2340 term disposal of transuranic waste. And again, to emphasize
2341 here, WIPP does not have an NRC license for radioactive waste
2342 disposal.

2343

2344 So, moving on just to the monitored retrievable storage efforts.

2345 And again, there have been many. The Nuclear Waste Policy
2346 Amendments Act authorized the Secretary of Energy to site an
2347 MRS, monitored retrievable storage facility. MRS was envisioned
2348 as an above-ground facility that's going to store a limited
2349 amount of spent nuclear fuel temporarily, prior to sending it to
2350 a permanent repository. So, the Nuclear Waste Policy Amendments
2351 Act prohibits MRS construction, monitored retrievable storage
2352 site construction, until construction of a permanent repository
2353 has commenced. So again, the benefits of early development and
2354 operation of an MRS facility were not achievable.

2355

2356 So, this actually brings me to the siting effort and the public
2357 participation effort of my, of my talk. And I want to spend a
2358 little bit of time talking about the Nuclear Waste Negotiator.
2359 So, as I mentioned, the Office of Nuclear Waste Negotiator was
2360 established in the Nuclear Waste Policy Amendments Act. It's an

2361 independent agency in the executive branch of the federal
2362 government, just like the NWTRB. It was independent from the
2363 Department of Energy. And the negotiator was responsible for
2364 developing an agreement between willing volunteer sites and the
2365 federal government to host an MRS, but if you read the
2366 legislation, or repository, if you can get a volunteer for that.
2367 The agreement is going to include some reasonable incentives and
2368 some financial arrangements. And that included various types of
2369 public programs, projects, and some problem-solving assistance.
2370 By problem-solving assistance there were actually Feasibility
2371 Study grants, which are not unlike the volunteer siting grants
2372 that are available now from the DOE, or were available, for the
2373 community to learn about the technology and the community to
2374 learn about what is nuclear waste? What are the storage
2375 technologies? How can we understand it before we make a
2376 decision?

2377

2378 So, the Nuclear Waste Negotiator actually awarded ten Phase 1
2379 grants up to \$100,000, to seven Native American tribes and three
2380 counties in Wyoming, Utah, and North Dakota.

2381

2382 And I have to have an aside here because I actually got involved
2383 in working on this project when I was on the faculty at Georgia
2384 Tech. And I worked with a woman named Carol Thorup. Carol Thorup
2385 worked for Nuclear Assurance Corporation, now NAC International,
2386 and she was from North Dakota. And so, she was instrumental in
2387 getting the North Dakota County Commission to essentially accept
2388 the Phase 1 grant, which was \$100,000. The downside to that was
2389 that citizens of that county were so upset that they had a
2390 recall election, and all five county commissioners were removed
2391 from office. So, there is probably not a good example of how you
2392 work with your community to let them understand what you're
2393 doing and have some community buy-in before you sign up with the
2394 federal government to take some money.

2395

2396 There were additional Phase 2A Feasibility Study grants that
2397 were awarded to three Native American tribes, the Mescalero
2398 Apaches, the Skull Valley Band of the Goshutes, and the Fort
2399 McDermitt Paiute Shoshone tribes. After an unsuccessful search
2400 for these volunteers sites, the Office of the Nuclear Waste
2401 Negotiator was terminated when Congress did not reauthorize
2402 funding in 1995. It originally had a five-year mission and it
2403 actually got extended for two more.

2404

2405 So, what did I do in Iowa? And why am I here to talk to you
2406 about it? Well, I actually started at Iowa State University on
2407 June 17th of 1992. I took a nuclear engineering faculty
2408 position. I was previously teaching at Georgia Tech, which is
2409 where I met Carol Thorup. So actually, following discussion with
2410 some family friends in a place called Corydon Iowa, which is
2411 where my wife grew up, I contacted the Wayne County Development
2412 Corporation to discuss the Feasibility Study grant. And you
2413 might want to ask why? Well, Wayne County is one of the is
2414 actually the third poorest county in Iowa. They had very limited
2415 funding for their Wayne County Development Corporation, WCDC.
2416 And, and again, I got to tell you this in 1982, they had an
2417 office and a typewriter. They didn't have a phone, they didn't
2418 have a fax, they didn't have a computer. And so they were trying
2419 to do economic development in a small county in southern Iowa
2420 with very limited resources. So, I discussed the opportunity for
2421 initially a Phase 1 grant, keep in mind that both the Phase 1
2422 grant and the Phase 2 grant, Phase 1 grant was \$100,000, Phase 2
2423 grant was \$200,000. It gives the county the opportunity to learn
2424 about nuclear waste storage. In addition, it gives them the
2425 opportunity to spend money and whatever they need to do. So,

2426 there was \$100,000 of free money if they wanted it, or \$200,000.
2427 Again, no commitment to accept until you got on to either Phase
2428 2B or Phase 3.

2429

2430 So, the Wayne County Economic Development Corporation actually
2431 did express an interest in learning more about the Feasibility
2432 Study Grant Program. So, in April of 1992, you'll notice this is
2433 even before I started work at Iowa State University, I called
2434 the Governor Science Advisor, Dr. Ed Stanek, and I wanted to
2435 discuss basically the Feasibility Study grants, Phase 1 and
2436 Phase 2 and the potential interest in Wayne County.

2437

2438 I have a little tidbit of information for you. None of you have
2439 heard of Dr. Edward Stanek, but he is a famous person because
2440 Dr. Ed Stanek, along, was also the, the director of the Iowa
2441 Lottery, and along with the director of the Oregon lottery, Dr.
2442 Stanek has the patent for Powerball. So, he actually, and I,
2443 there's an interesting article I looked up on him. There were
2444 royalties from the patent that he got none of; it all went to
2445 the state because he was a state employee. And again, what did
2446 he, what did you patent? The patent was actually two ball, two
2447 sets of balls instead of one, that was the patent.

2448

2449 Anyway, Dr. Stanek did meet with the Governor's Chief of Staff
2450 on our behalf, Dr., Mr. David Roederer. Mr. Roederer then met
2451 with the Governor and scheduled a meeting in mid-June of 1992
2452 with Governor Branstad and Dr. Stanek to discuss the Wayne
2453 County interest in the MRS feasibility grants. So, on June 17th,
2454 there was a budget crisis, and the Governor postponed the
2455 meeting. And so that was a key because on June 30th, Phase 1
2456 Feasibility Study grant application deadline passed. So now
2457 we're talking Phase 2.

2458

2459 So, in July, the Wayne County Development Corporation decided to
2460 quote "express interest" in the Feasibility Study Grant Program.
2461 And on July 20th, Mr. John Hendren, who was the president of the
2462 Wayne County Development Corporation, called Dr. Stanek to
2463 discuss their interest in the Feasibility Study Grant Program.
2464 On the 22nd, Dr. Stanek, again met with the governor and
2465 presented the MRS issues.

2466

2467 And here are the key things that were important in that meeting.
2468 The governor asked if there was any county that expressed
2469 official interest, and Dr. Stanek said, "No official expression

2470 of interest," but Wayne County had discussed the program and
2471 Governor Branstad said, "No, not going to do it." So,
2472 discussions regarding the Feasibility Study Grant Program did
2473 continue in Wayne County. And in fact, in August of that year,
2474 Omaha Public Power District Engineer, Mr. Kim Walden, and I
2475 actually went down to the Wayne County Development Corporation
2476 meeting and made a presentation regarding the technology. And
2477 again, the Wayne County, and again, I want to talk about the
2478 tech, I talked about spent fuel storage technology, Mr. Kim
2479 Walden talked about the program, the benefits, and the things
2480 that it could do for them.

2481

2482 So again, the Wayne County Development Corporation decided, to
2483 discuss this and basically thought it was, they had a generally
2484 favorable opinion to this. So, they decided to formally contact
2485 the Office of the Nuclear Waste Negotiator. So, on September
2486 2nd, Mr. Hendren wrote the letter, and actually Mr. Chuck
2487 Lempeis then made informal contacts with the Governor's Office
2488 and the Governor's Office suggested MRS discussion wait till
2489 after the November election.

2490

2491 So, here's a copy of the letter that actually was sent by Mr.
2492 Hendren from the Wayne County Development Corporation to the
2493 Governor's Office. And you'll note that the deadline for Phase 2
2494 Feasibility Study grants at that time was September 30th of
2495 1992. And that was a potential problem. Ultimately, the Phase 2
2496 study grant was extended to March 31st of 1993.

2497

2498 So, in October, there was a call between the Waste Negotiators
2499 Office, the Wayne County Development Corporation, and myself to
2500 discuss a strategy to talk to the governor. So, November 2nd was
2501 Election Day, November 16 the Wayne County Development
2502 Corporation officially expressed interest in the study grant.
2503 And again, on December, on November 24th, I actually had to
2504 brief my administration about what I was doing.. with relation to
2505 Wayne County and the study grant.

2506

2507 Now, you might say, "Why is a university professor doing all
2508 this?" Part of my role was actually engineering extension, and
2509 as engineering extension for the Land Grant University for which
2510 I worked, that was one of the things we did was we reached out
2511 to counties and provided information that they might need.

2512 Again, mine was the expertise associated with interim storage of
2513 spent nuclear fuel and high-level waste.

2514

2515 So finally, on December 1st, the Nuclear Waste Negotiator staff
2516 members, Chuck Lempesis and Bob Mussler, met with the Economic
2517 Development Corporation. And then on the 15th, they met with the
2518 governor's chief of staff, and the governor's press secretary in
2519 the Governor's Office. And then finally on the 30th, Mr.

2520 Roederer, who was the governor's chief of staff, Mr. Hendren,
2521 from the Wayne County Development Corporation, and basically got
2522 the governor to, quote, "Say he will consider the issue." So, on
2523 the 19th of, of January, we scheduled a meeting for February
2524 4th, and had a conference call between the Nuclear Waste
2525 Negotiator, the Wayne County Corporation, and myself to discuss
2526 how we met with the governor. Very interesting meeting with the
2527 governor.

2528

2529 So, besides the Governor, it was his Chief of Staff, Mr. Vos,
2530 who was his Press Secretary, Mr. Lempesis, who was the Chief of
2531 Staff of the Nuclear Waste Negotiator Office, Bob Mussler, Mr.
2532 Hendren, who was the former president of the Wayne County
2533 Economic Development Corporation, and Mr. Ralph Alshouse, who

2534 was the new president, he had just taken the office, and I were
2535 there. And I remember sitting in the back of the room, because
2536 that was what I did, and the governor was very pessimistic. So
2537 he described essentially some issues that were bothering him,
2538 like a new, a recent problem with a medical waste incinerator.
2539 He talked about some of the potential public and political
2540 backlash. But he listened to the Wayne County Development
2541 Corporation, and essentially talked a little, as they talked
2542 about their need for the Feasibility Study grant. And then the
2543 government, governor actually started asking me questions, he
2544 expressed an interest in the technology. How safe was it? And so
2545 I gave some answers associated with essentially the safety of
2546 interim storage.

2547

2548 And we got the governor, at the end of the meeting, to say one,
2549 he supports nuclear power, two, he said he will not behave as a
2550 demagogue on this issue, which I thought was great. And then he
2551 agreed not to oppose the study. He wasn't going to support it.
2552 So here's a much younger Dan Bullen in the newspaper,
2553 essentially talking about the issues at the Wayne County
2554 Development Corporation meeting on February 6th of 1993. I
2555 discussed some of the technical challenges, and Wayne County

2556 Development Corporation people discussed the Feasibility Study
2557 Grant Program.

2558

2559 So, February 6th, we had the meeting, on February 9th, we
2560 actually got a front-page article, below the fold, in the Des
2561 Moines Register, where the MRS was discussed, MRS issue was
2562 discussed as an economic... from an economic perspective. Mr.
2563 Hendren, who was the former president of the Wayne County
2564 Development Corporation, was quoted in the paper saying, "We're
2565 not a bunch of crazy people establishing a nuclear waste dump.
2566 We're just trying to get more information on this point." Very
2567 important thing to say. And Mr. Vos, the governor's press
2568 secretary quoted, "Governor Branstad wouldn't block the study,
2569 but says he's not supporting their efforts. The governor
2570 believes the safety, social and political issues are stacked
2571 against the decision to proceed." So not a ringing endorsement,
2572 but he wasn't going to say no.

2573

2574 So, there's a copy of the article. We actually got some, some
2575 good news there. And, and again, we got the governor on the
2576 record in the Des Moines Register to say that he would not
2577 oppose it.

2578

2579 So, what happened next? On February 9th, there was a meeting of
2580 the Wayne County Development Corporation to discuss the process
2581 to apply for this. 37 people, or actually 40 people showed out,
2582 showed up, 37 opposed, not only the grant program, they opposed
2583 any discussion about it. So, on the 13th, there was an
2584 additional meeting called to discuss the proposal and they voted
2585 to abandon it. All efforts to pursue the Feasibility Study Grant
2586 were abandoned. So, what happened? So, there was opposition that
2587 was quickly organized by a local businessman. And there was a
2588 significant effort by the local business leaders to not only
2589 stop the program, but to prevent discussion. And that was
2590 actually enlightening to me, about anything related to monitored
2591 or favorable storage Feasibility Study grants. And again, the
2592 new president, who I mentioned previously, Mr. Ralph Alshouse,
2593 quit. He, he resigned from the Wayne County Development
2594 Corporation, and wanted to continue this effort, and he did.

2595

2596 So, on the 18th of February of 1993, there was another article
2597 about the fact that he had quit, and he plans to launch a
2598 petition to essentially continue this effort. And so he wanted
2599 to look for another county. So, Corydon was one, was the county

2600 seat of Wayne County. The next town over is a little town called
2601 Seymour. So he went to Seymour, wanted to get to the Seymour
2602 City Council to show some interest. So his petition basically
2603 fell on deaf ears. And after initiating the petition, prior to
2604 the grant application expiration of March 31st, he failed to
2605 generate enough interest in this.

2606

2607 And essentially, interestingly enough, in the lower part of
2608 this... I guess I can do laser here... you can see down here that
2609 there's another article. The local legislator from Wayne County,
2610 got a bill passed, that basically said, and it passed in the
2611 Senate 49 to 1, "That required legislative approval of any
2612 permit for nuclear waste storage or disposal in Iowa." So we did
2613 get a response, happened to be negative, but we raised that
2614 issue.

2615

2616 So, what did we learn? So, we had an extensive effort to
2617 identify a potential interested locality. I had personal
2618 contacts with the community, and I think that's important. I'll
2619 tell you a little bit of a side story in just a second. And
2620 there was actually community motivation and some potential
2621 benefits that were discussed. So, the contacts were both at the

2622 local level, at the county level, and at the state level. But I
2623 would argue that there are very long-term efforts that are
2624 required for this to be a success. And part of a problem that I
2625 ran into was this was scheduled driven. Basically, I missed the
2626 Phase 1 study grant because we couldn't get it done in time. And
2627 the Phase 2 grant, which ended on March 31, essentially, that
2628 effort passed, so, so we couldn't do it.

2629

2630 So, what do we need to understand with respect to the
2631 ramifications of the efforts? Well, I think we understood the
2632 political efforts. And you can see the political efforts in the
2633 Governor's Office immediately saying, "Hey, let's wait till
2634 after the election. I want to be elected first and then we'll do
2635 this," okay? And the second one was the social interaction. But
2636 there was an aside there that, you know, basically, we didn't
2637 have the Wayne County Development Corporation, or even
2638 engineering extension in my view, coming in to actually provide
2639 enough information, have the kinds of communication and
2640 discussions that are necessary over years and decades, not weeks
2641 and months. So, we had a real time constraint. And then there
2642 was the economic impact.

2643

2644 And I have an aside. So, after we failed in Wayne County, and
2645 Mr. Alhouse was, wanted us to do it and Seymour, I actually went
2646 down and present it to the Seymour City Council on a Tuesday
2647 night for their regular meeting, and they had significant
2648 opposition. But I was driving back to Ames, where I lived with
2649 my family, and as I drove through Corydon, which was on the way,
2650 I looked off to the side to essentially the family friend that
2651 had been helping me out to do this. And there were two major
2652 employers in Wayne County at the time. One of them was a lead
2653 acid battery manufacturer, a personal family friend of ours, the
2654 other was a grain dryer manufacturer. So, a grain dryer, big bin
2655 that's got a gas blower on it that drives the grain.

2656

2657 So, I actually was driving by the, the lead acid battery
2658 manufacturer's plant at 10:30 at night, and I looked over and
2659 the light was on in my, my friend's office. So, I actually went,
2660 opened the front door, which was unlocked, stuck my head in and
2661 said, "Roger, are you here?" And for the next hour, I asked, I
2662 asked my friend Roger, who is the president of this corporation,
2663 "What happened?" Well, come to find out when we came and talked
2664 about the economic development advantages. At that time, the
2665 minimum wage in Iowa was \$4.65 an hour. And when the Nuclear

2666 Waste Negotiator staff came to talk, when the Wayne County
2667 Development Corporation people talked, when the nuclear power
2668 people talked, came over from Omaha, we talked about building
2669 the facility and paying the crafts persons, the carpenters, the
2670 concrete workers, the metal workers \$15 to \$20 an hour. And if
2671 you're paying \$4.65 an hour, you immediately look like you're
2672 going to go out of business if you can't hire people. And again,
2673 we had a very limited pool of resources to deal with there. So
2674 then in, in closing, I asked Roger, my friend, I said, "Roger,
2675 what did you think was going to happen to your business?" And he
2676 said, "Well, I was going to have to raise my, my wage from, by
2677 maybe \$2 or \$3 an hour, but in doing that, I was going to get a
2678 more dependable worker, somebody who showed up for work, I was
2679 going to get a more skilled worker, because I can actually ask
2680 for someone to have more skills, and I was going to get a more
2681 committed worker who wanted to work and actually do the job. So,
2682 over the short term, I would lose money. But over the long term,
2683 I would be more efficient, more productive, and more
2684 profitable." So that was my lesson to learn that, essentially,
2685 there are people that have the foresight to look farther than
2686 the latest quarter on their balance sheets, and there are people
2687 that don't.

2688

2689 So, some of the key lessons learned, and hopefully I'll get this
2690 done in 45 seconds. So, siting and development process takes
2691 decades. And my two previous speakers told you that in spades. I
2692 told you an event that happened in, in a mere matter of months.
2693 And you need essentially some political stability and support
2694 for this. Again, I did not have political support, I had a
2695 commission, a commitment to not oppose, which is not support.
2696 Okay, so basically, so you got to worry about changes in
2697 governance. And again, we have an election cycle that happens
2698 every four years for the White House. And so essentially, when
2699 you change that, you can have an impact on the states, impact on
2700 the tribes. And again, this is what happened in some of the
2701 interim storage facilities that we're talking about now. And
2702 then federal changes have also stopped programs, both the MRS
2703 and the Yucca Mountain project. So, states have to have a larger
2704 role in determining whether a facility can be sited and
2705 operated. And again, sort of permits beyond just the license are
2706 needed. And again, all of this has fomented or facilitated a
2707 history of mistrust throughout the program in the United States.
2708 So, with that, I think I'm done. And I would be happy to answer
2709 any questions.

2710

2711 SIU: Thanks, Dan. Okay. Scott?

2712

2713 TYLER: Dan, Scott Tyler from the Board. Thank you so much.

2714 Pretty depressing presentation.

2715

2716 BULLEN: Sorry.

2717

2718 TYLER: But I guess getting to this question, I, too, see the
2719 role of states seems to be critical in this, and provinces or
2720 cantons, so the regional governments. So, in your view, from
2721 your experiences, what are the things that we need to change in
2722 our programs, in interacting with state governments?

2723

2724 BULLEN: So, this is probably going to take away some thunder
2725 from what I'd like to say during the panel discussion, but I
2726 would like to point to the examples of the previous two
2727 speakers, that we need an independent agency, not unlike SKB, to
2728 essentially be responsible for the waste. And it's their
2729 responsibility to interact both with the federal government, the
2730 state government, the local government, to actually be the
2731 responsible party for developing it. And again, I'll harken back

2732 to the Blue Ribbon Commission said the same thing. There's
2733 nothing new with what I'm saying, but I would like to reiterate
2734 that if we had an independent organization that wasn't subject
2735 to the whims of periodic elections, that wasn't subject to the
2736 whim of funding, again, it's nice to know, we've got billions of
2737 dollars in the nuclear waste fund that essentially were used to
2738 offset the deficits in the '90s in the early 2000s, but
2739 essentially, have the wherewithal to make the decision to spend
2740 the money, do what is necessary, both from the technical side,
2741 but also from the social engagement side.

2742

2743 And I would give credit to the Yucca Mountain project effort.
2744 They did have public participation in Nevada, they did have
2745 facilities that people could come visit, they ran tours of Yucca
2746 Mountain, and I took many of them when we had the international
2747 high-level radioactive waste management conferences there. It
2748 was really interesting to see the interactions that they had
2749 both with the stakeholders in the state, but then when we
2750 brought the international community in, and we would ride the
2751 bus out to the, the Nevada, to pass the Nevada test site, to
2752 Yucca Mountain, and you'd get these people from Europe who are
2753 going, "Well, I'm going to put a repository in salt and it's

2754 going to be right next to farmland," and then they look for
2755 miles and see desert, and essentially the Amargosa Valley that
2756 the river runs into Death Valley, so we're probably not going to
2757 be growing any crops there. So, it was interesting to see that
2758 kind of interaction. But again, I'll reiterate that a lot of the
2759 things that have already been said in the Blue Ribbon
2760 Commission, and even said in, in publications by this Board
2761 should be followed.

2762

2763 TYLER: Thanks, Dan. Thanks. Can you give an, quick follow up.
2764 Were there any lessons learned from the WIPP site and the
2765 interactions with the New Mexico government that was a success
2766 story?

2767

2768 BULLEN: You bet.

2769

2770 TYLER: Are there any things we can take from that?

2771

2772 BULLEN: So, sort of two things there. They had an independent
2773 group that was essentially overseeing everything that was
2774 happening technically there, and that was important. But I would
2775 actually argue one more thing. They started what was called, I

2776 think it's the 180(c) Grant Program. So, part 180(c) actually
2777 provided funding for local municipalities along the
2778 transportation routes, to educate the firefighters and the first
2779 responders, police officers, about the shipments of TRU waste as
2780 they came through the facilities. And so, you had these 180(c)
2781 programs, where they, I mean, they gave them equipment, they
2782 gave them training, they talked to each of the responders along
2783 the routes, so that they would know what would happen if they
2784 had to respond. The benefit to that was when it finally got to
2785 the point where WIPP was going to say, "Well, we're going to
2786 start shipping waste from these remote locations," and you got
2787 the mayor of some small town going, "What the heck?" And he goes
2788 to talk to his police chief and his fire chief, and they're
2789 going, "Yeah, we know all about this. Yeah, they trained us.
2790 Yeah, probably not the best thing, but we can handle it." And
2791 then the mayor is going, "Okay, well, they told me, 'We can
2792 handle it.'" So that's actually a good lesson learned.

2793

2794 Now, whether we're going to talk about that with respect to, you
2795 know, rail shipments to Yucca Mountain and the like, is another.
2796 But what it was DOE's outreach at the time that said, "Look, we
2797 need to be able to inform the people." And actually, it doesn't

2798 hurt to inform the people who are going to be the responders,
2799 because they're the ones that you have to have confidence in.
2800 Because obviously, even if there's an accident, it's not DOE
2801 that shows up the first time, it's the local sheriff or the
2802 police officer or the firefighters. And as long as they're
2803 confident that they know what it is, what they need to do
2804 initially, then I think that's a benefit. And that's a good
2805 lesson learned.

2806

2807 TYLER: Sure.

2808

2809 BECKER: Steve Becker, Board. Thanks for that very nice,
2810 comprehensive overview, and especially for the detailed case
2811 study on Iowa. It was very interesting. So, you've probably
2812 heard a number of the previous speakers talk about the value and
2813 importance of direct communication. Based on your experience,
2814 how do you see the role of direct communication, and who should
2815 be doing it?

2816

2817 BULLEN: So, every country is different. And I'll say that, and
2818 I'll actually say that one of my goals when I started for direct
2819 communication, was actually to use the university system in

2820 Iowa. And I think the university systems are a good place to
2821 start because, well, I don't know if they still do, but we used
2822 to as professors, back when I was one, have a lot of trust from
2823 the community. So, you're there to basically provide the
2824 technical bases for what you're doing. And I thought local
2825 universities, whether it be land grant universities that have
2826 engineering extension, or AG extension, or home economics
2827 extension or what, actually, I guess it's family science
2828 extension, I don't know what they call home economics anymore.
2829 Anyway, those kinds of people who are in your community, who are
2830 there, can actually answer the questions that have been raised
2831 and follow along the concerns that might be raised.

2832

2833 And again, I'll say that there are three important things that
2834 my predecessors have said, those three things are communicate,
2835 communicate, communicate. Those are the things that you have to
2836 be able to do to basically engage the, the public and get that
2837 trust. Now, I'm not sure we still have a level of trust as
2838 university professors, but that was a good starting point. And
2839 if you could, you could engage that, that would be a good first,
2840 first principles to begin with.

2841

2842 BECKER: Thank you.

2843

2844 BULLEN: You bet.

2845

2846 SIU: Okay. Do we have any other questions from the Board?

2847 Hearing none.

2848

2849 BULLEN: Thank you.

2850

2851 SIU: Thanks again, Dan. Now, we will start a facilitated panel

2852 discussion led by Dr. Bret Leslie.

2853

2854 LESLIE: As our panelists get settled in, let me talk and

2855 describe briefly ...how I... we're planning to have this facilitated

2856 discussion proceed. And one of the things I'm going to ask

2857 Nathan to do is, is if I don't leave enough time for Board

2858 comments, please interrupt me. I may get too involved in

2859 facilitating this. But the idea right now is I've asked the

2860 panelists to kind of start off with one point that they heard

2861 from this morning, from both, from Lisa and from the other

2862 people sitting at the table, to kind of expand on or, or ask a

2863 question or think that it's important to go, you know, expand

2864 and look or ask a question, you know, how did you really do
2865 that? And then from there, I'm just going to allow you three to
2866 kind of identify topics that you want to further elucidate, like
2867 what Saida said, "Well, maybe I can get to it in, in the panel
2868 discussion," that same thing. If you can just either raise your
2869 hand or flip your tin up, then I can kind of guide and figure
2870 out who's going to talk first and go that way.

2871

2872 Basically, it's a discussion amongst you. If you start to slow
2873 down. I'll have some questions. Dan, do clarifying question on
2874 the process?

2875

2876 BULLEN: No, I was going to dive in and ask Saida a question.
2877 That's okay.

2878

2879 LESLIE: Well, I was going to start with Saida as a first
2880 speaker.

2881

2882 BULLEN: You can, you go ahead. You go ahead.

2883

2884 LESLIE: And then we'll go to Piet and then go to Dan.

2885

2886 BULLEN: Okay, great. Thank you.

2887

2888 LESLIE: So Saida, anything that really hit you this morning in,
2889 in listening to Lisa or Pete and Dan?

2890

2891 ENGSTRÖM: I think something that Dan said about every country
2892 is different. I agree. But you had one of, in your technical
2893 directive to us about today, what's transferable from one
2894 program to another? And I must say, if you have a federative
2895 system, like United States or Switzerland, you have one more
2896 degree of complexity, of course. If you compare to the Swedish
2897 situation, well, we have the national level and the communal
2898 level, easier. But if you take that, and if you take the frame
2899 of politics, everything else is transferable, I must say. The
2900 legal frame, the political system, but even then you can tweak.
2901 We did it, when it's not working for you, you can do something
2902 with it. And basically, what I heard that Piet, not the least,
2903 said this morning, and Lisa, is people react in the same way.
2904 And I had the pleasure to meet people in Japan, in Canada, in
2905 the US, in most of the countries in Europe, and they react the
2906 same way our Swedish citizens in these small communities do. So
2907 how you meet them and how you interact with them should be

2908 different tools, can be transferable. And this is actually
2909 something that I think is... it's good to try to do something
2910 with, not to reinvent the wheel, just steer with pride.

2911

2912 LESLIE: Piet?

2913

2914 ZUIDEMA: I really liked what Lisa said, that there was
2915 agreement about do something now. And I think that's one of the
2916 most important things, you know, and that it is, and there, I
2917 think, it's very important that high up, you know, the
2918 parliament or something like that, recognizes that. And there, I
2919 think I have, in a way, the difficulty, why this fire doesn't
2920 take place here? For two reasons, first of all, you have a huge
2921 amount of fuel lying around, and, you know, you're not so close,
2922 but you're closer, Ukraine. Look what happens to nuclear
2923 material on surface. You should talk to them.

2924

2925 And the second thing is, we all know that we will run into a
2926 real problem with our climate. And we are not able to bring this
2927 fuel in safe storage and underground. I mean, then one has to
2928 say something is wrong and assist. And now provoking, but I
2929 think it's really, for me striking. You're in the early days I

2930 remember you had, in your parliament you had active people, and
2931 it seems to be more silent at the moment. So, in my view, that's
2932 the first thing, make sure that people in Congress say, "Hey,
2933 you have to move." And then the second thing is have people that
2934 have different roles, put not all roles into one organization.

2935

2936 LESLIE: Thanks, Pete. Dan?

2937

2938 BULLEN: I would agree that we really do need the political will
2939 to do something, and it's kind of a challenge associated with
2940 what we're doing right now. But I have a little bit of an aside
2941 question that was in the back of my mind as I sat and watched
2942 the two previous speakers. And one of the things that we're
2943 struggling with right now isn't even a repository, it's an
2944 interim storage facility. And Sweden has been very successful
2945 with CLAB, it's been a very successful facility. And so what I'm
2946 interested in his understanding, what participation did you have
2947 in siting your interim storage facility, and how did that
2948 interaction with the locals, and I recognize it's at a nuclear
2949 power plant, so it's a little bit different, but could you just
2950 give us a little bit of a background on how your interim storage
2951 facility was sited and what interactions you had?

2952

2953 ENGSTRÖM: Yeah. It look nothing like what I told you about the
2954 final repository. When we started nuclear, Sweden had huge
2955 ambitions. The original plan was actually to construct 24
2956 nuclear power plants. We did 12. And nuclear were, were huge. We
2957 had actually even a nuclear weapon program that we terminated
2958 later. So nuclear was accepted by society, completely at that
2959 time. And we're talking, when we talk about the central interim
2960 storage, we're talking about the mid-'70s, when the discussion
2961 started. And at those times, constructing a nuclear facility, be
2962 it a nuclear power plant, or in this case, central interim
2963 storage, was a business between the industry, the community,
2964 which is actually not the citizens a priori, but the county
2965 council of the municipality and the state. So, there's huge
2966 meetings that we did later, we had to do later to discuss with,
2967 they were limited to maybe a couple of meetings in the city
2968 hall. So, it was other times, and nobody required that. So, we
2969 went with the times, nobody expected, I mean, lots of
2970 interactions with the industry, or there was no opposition,
2971 either. So, there was no need. We've been discussing with the
2972 Municipality Council, and we were discussing with the
2973 government, and we want ahead after an application and the

2974 review of that application. So, the times changed, and we
2975 changed with it. Adaptive was one word I used earlier, and this
2976 is what we did, actually. So, it was an easy exercise with
2977 central interim storage.

2978

2979 LESLIE: Go ahead, Piet.

2980

2981 ZUIDEMA: Well, probably I can also make some comments about
2982 interim storage, because Switzerland also had its difficulties
2983 and its opportunities. And there, what we observed is, if you go
2984 with your interim storage to places where nuclear is anyway
2985 there, that's a different story than to go somewhere where
2986 nothing exists. And so, it was very clear, you know, when one
2987 needed more, more space, go where you already have nuclear
2988 facilities. And that also technically make sense, you know,
2989 these sites with respect to earthquakes, they are probably not
2990 the most stupid places, because you have a reactor there. And so
2991 in Switzerland, elsewhere it turned out to be rather difficult,
2992 but at a nuclear place, that was no problem whatsoever, because,
2993 you know, people were used to it. And they're, in that sense,
2994 with the ..has the potential, bigger or comparable thing, so
2995 when you go to a nuclear site, it was no problem at all.

2996

2997 LESLIE: So, let me ask a follow-up question, and then we'll get
2998 you to Dan.

2999

3000 BULLEN: Okay, no problem.

3001

3002 LESLIE: So, both Saida and Piet, you talked about the
3003 repository system, and Dan had the question, "Well, what about
3004 the, you know, the storage facility?" How much, when you were
3005 focusing on the repository program, was how, where the waste was
3006 stored and how we get there and how it's all integrated program,
3007 so they, did the communities, how much did, did either SKB or
3008 Nagra talk about it, not just we're focused on a repository, but
3009 this is a larger system?

3010

3011 ENGSTRÖM: Oh, all the time. Actually, they, they want to know
3012 what are you going to bring here? And what we did for many
3013 years, we took buses from, for instance, to community where the,
3014 the final repository will be built now, Östhammar, a couple of
3015 hours north of Stockholm, took them with buses, and we had a
3016 weekend, any citizen that wants, we had them for a weekend, in
3017 Oskarshamn, wherein the central interim storage is located. And

3018 they had to visit, to see that all the spent fuel, because they
3019 have these ideas about huge amount of spent fuel, and suddenly
3020 they've been standing by the pools, and looking at the waste
3021 that generated electricity for us since the '70s. And there are
3022 people that are working, they're not dying, all these things.
3023 So, the old system, and talking about what are they going to get
3024 if they get this final repository, and how is it managed today?
3025 And listen with the community hosting this central interim
3026 storage, how was the interaction with SKB? These were extremely
3027 important questions. I want just to add one thing, to the
3028 former, to your question about the central interim storage, if
3029 it was to be located today, I'm not sure it will, it will be
3030 easy, breezy exercise, that I have to say. Maybe not the degree
3031 of difficulty with the final repository, but still, it will not
3032 be as easy as it was in the '70s.

3033

3034 LESLIE: So, Piet, on, on, on Nagra?

3035

3036 ZUIDEMA: Well, I think there are several things to it. First of
3037 all, yes, they are really interested, because for two reasons.
3038 First of all, they want to be sure that this storage is safe and
3039 that it is the capacity to take the waste now, that they can do

3040 the job as the repository with the necessary care that we have
3041 the time to do a proper job. So, they are really interested
3042 that, that there is not a hidden agenda that we are under
3043 tremendous time pressure, and we have to rush through. And the
3044 other thing is also what Saida said, you know, they go there and
3045 then the first thing is, if you compare this normal industry,
3046 it's just small, you know, it's just small. Same as this
3047 transportation, you know, you have to put it into perspective.

3048

3049 And I think that's one of the most important things in general,
3050 we have to put things into perspective, because, you know, the
3051 public hears so many things, then they think this must be
3052 tremendously dangerous and tremendously difficult. And so, I
3053 think it's really important to put things in perspective. And I
3054 think an interim storage is really fantastic, because it's that
3055 small and that amount of energy that you got out of that.

3056 Compare it with the trains that go to the airport every day to
3057 get kerosene there, and put that into perspective. And then you
3058 know that the dangers are, you know, these kerosene trains.

3059

3060 ENGSTRÖM: We've got also lots of help from the underground
3061 laboratory. We have an underground laboratory at 464 meters down

3062 in the granite, that's built exactly the way the final
3063 repository will be built, with galleries and people can see this
3064 is what they are going to build. And we did the same thing
3065 there. We took people. First, we took all the county councils of
3066 these municipalities, buses down to Oskarshamn to see the
3067 underground laboratory and then citizens. And it became so
3068 popular that we had actually to hire extra staff just to manage
3069 these kind of trips.

3070

3071 LESLIE: So, Dan, back to you had a question or a comment?

3072

3073 BULLEN: No, actually, Saida spurred a memory, long distant.
3074 When I was talking about the passage of the Nuclear Waste Policy
3075 Act, and she mentioned times changed. So actually, after they
3076 passed the Nuclear Policy Act, the "Las Vegas Review Journal,"
3077 and the Las, the Nevada legislature, both supported studying
3078 disposal of spent fuel at Yucca Mountain. Now, that quickly
3079 changed, but at the time, there was an opportunity to try and
3080 open a dialogue to share information, if you got both the major
3081 newspaper and the state legislature at least interested in the
3082 prospect of this.

3083

3084 Now that was when there were nine sites, not one site. But
3085 that's just an area where you can see that times have changed.
3086 And again, I don't think we have a chance of putting anything at
3087 Yucca Mountain now, just because of the local, excuse me, the
3088 state opposition. I would say local opposition, opposition in
3089 Nye County may be split now, but there was at one time support
3090 in Nye County. So again, times change.

3091

3092 LESLIE: Other questions, comments? Go ahead, Saida.

3093

3094 ENGSTRÖM: I said I didn't touch upon the added value, and I
3095 said that money, it was a very, very important that money was
3096 not on the table for discussion before the site selection is
3097 done. So we kept no, no discussion about the money until the
3098 last year before the decision. And we knew that we had two
3099 communities, Oskarshamn and Östhammar. We had to build two
3100 facilities, the encapsulation facility and the final repository.
3101 And they wrote a, a letter to the government and to us saying,
3102 stating, both of them, both the mayors together and, stating
3103 that, "We are shouldering responsibility for a national
3104 challenge locally." And with will... some kind of thank you from
3105 the state and the, and SKB and SKB's owners, in form of some

3106 investments. The government, of course, kept dead silent. They
3107 had nothing to say. They didn't want to say anything. But we
3108 started discussion, and this was the last year before we decided
3109 which community will have the final repository.

3110

3111 At that time, they were also, at this time of the process, they
3112 were competing, the prize was getting the final repository, and
3113 compare that to 25 years earlier when we were persona non grata
3114 and nobody would even talk to us, not even these two that are
3115 nuclear communities, but now they're competing to have it.

3116

3117 And they decided, we had discussions with them, and all along
3118 they knew what kind of investments will be happening, if you get
3119 the final repository, for instance, the jobs, the influx of
3120 engineers and people living in this small community. And mind
3121 you, none of these communities had any unemployment, almost
3122 none, 2% is technically none. So, they want influx and, and all
3123 that. And when they started to talk about money, they decided
3124 among them, the mayors, that the community that would get the
3125 final repository will get only 25% of the money that would be on
3126 the table, and the one that didn't get it will get 75%. And we
3127 had lots of hard time... explaining that to people, because lots

3128 of people saw it as a compensation. We didn't see it like that.
3129 We... you cannot compensate some... you compensate somebody when
3130 you've done something bad. This is not a compensation. This is
3131 actually, and not even money changing hands, what we did is
3132 actually the money certain, we agreed about the amount of money,
3133 which is not much by your eyes, it's two billions of kronas, and
3134 it's not money changing hands. We had a Board, where the mayors
3135 are sitting, where we are sitting, and we decide about projects
3136 that are suggested by the communities with a win-win. We did,
3137 for instance, a technical college, we built a technical college
3138 in both municipalities because we want to hire people from
3139 there. And we built roads, and we did lots of other things to
3140 make, for instance, there were no hotels and we knew if we build
3141 a repository, you will be coming to visit, and we need some
3142 hotels, lots of these things, but no money exchanging hand, just
3143 that. Projects, we discussed the projects, a win-win, and that
3144 has been extremely successful. I think if we talked money early
3145 in the process, we will be killing our program completely.

3146

3147 LESLIE: Yeah, Dan.

3148

3149 BULLEN: Just a quick follow up on that. I remember a famous
3150 picture right after the announcement was made, and there was a
3151 smiling mayor and a disgruntled mayor. Can you talk about the
3152 disappointment in, in the non-winner, or how that manifested
3153 itself?

3154

3155 ENGSTRÖM: You don't know it, actually, but I was the one
3156 delivering.

3157

3158 BULLEN: Oh, I did not know that.

3159

3160 ENGSTRÖM: Yes. I was the one and it was on our ship, The Segan.

3161

3162 BULLEN: Yes, it was right in front of the ship.

3163

3164 ENGSTRÖM: And I sat with both, and, and I had in my head
3165 prepared what I should say, and they were sitting there, you
3166 know, livid, both of them, and it was like the Oscars, you know,
3167 everybody, and it was bizarre. Thinking about it now, I think it
3168 was bizarre. And I had to say, I, we have, anyway, we have a
3169 relationship with both communities for many years and we will be
3170 building encapsulation facility in one and final repository in

3171 the other. And we made two safety analyses in both, which we
3172 did, and there is one with much higher margin, and I think the
3173 safety authority would never allow us to take the one with the
3174 lesser margin, even though lots of things would, would point at
3175 that community.

3176

3177 So, it'll be in, in Östhammar, and actually the mayor of
3178 Östhammar, and his head of staff, he almost jumped from his, and
3179 the other one was teary. That, what does that show you? It shows
3180 you actually the degree of engagement that these people put in
3181 this project for 25 years. They learned so much. They put so
3182 much effort in those in discussing with us, in discussing with
3183 their citizens. So his tears was not, were not only he, he will
3184 be having the encapsulation facility, the smaller piece, it was
3185 also all the work he's done to have that and he didn't get it.
3186 It was some kind of 'Isappointment in relation to t'e effort and
3187 engagement through the years.

3188

3189 LESLIE: Other points you guys want bring out from what yo've
3190 heard this morning? Otherwise, ' 'm sure I have Board members who
3191 will be anxious to ask you questions and continue the
3192 conversation. So go ahead Steve.

3193

3194 BECKER: Steve Becker, Board. So, Lisa mentioned this morning
3195 that meeting the challenge of disposing of nuclear waste is
3196 truly global in its nature and what happens in one place affects
3197 every place. And for me, that brings to mind what can happen to
3198 a sighting process when there's an external event that's
3199 unanticipated. And in particular, I'm wondering how the events
3200 in 2011 at the Fukushima Daiichi Generating Station affected the
3201 various processes that you're familiar with?

3202

3203 ENGSTRÖM: I must, I must say, it didn't impact any work we did
3204 on Nuclear Waste Management at all. What it did impact,
3205 actually, it gave some arguments to the Greens that were in
3206 power by then, with the Social Democrats to phase out two more
3207 reactors, fully well-functioning, safe reactors have been phased
3208 out by a heavy load of taxes. So, it was not, it was not,
3209 economically viable to, to run them. So that's, that happened as
3210 a direct consequence. But we did polls, we do polls every year
3211 in those communities, and it didn't change anything. The trust
3212 they had in the nuclear power plant in their community, the
3213 trust they had in SKB, the trust they had in safety authority,
3214 didn't change at all.

3215

3216 BECKER: And I'm assuming you would attribute that to the
3217 extensive history of community engagement and trust building?

3218

3219 ENGSTRÖM: Absolutely. Absolutely.

3220

3221 LESLIE: Piet, were there any impacts in Switzerland?

3222

3223 ZUIDEMA: Well, yes, but I, there, well, I, this is a bit
3224 delicate what I say now. What some people were worried about is
3225 what we call the famous nuclear culture. Why did that happen if
3226 we say we have a strong nuclear culture? And that was, you know,
3227 in a way, a bit critical, because that shows that one pretends
3228 that one has a high culture, and it seemed then that the culture
3229 was not that high, or something was not going that well. And so
3230 that, in that sense, it raised some questions, not very much,
3231 but it was really, you know, safety culture being really, really
3232 important. So, it enforced that again.

3233

3234 ENGSTRÖM: Yes. Yes, absolutely.

3235

3236 BULLEN: Dan Bullen, just, just to reiterate that. If you'll
3237 look at the historical perspective, Fukushima Daiichi wasn't
3238 even the closest nuclear power plant to the epicenter. Fukushima
3239 Daiichi fortunately didn't lose all offsite power. In fact, took
3240 Herculean efforts to bring offsite power to the site to be able
3241 to run their pumps.

3242

3243 And so that again, was, one, one site manager essentially taking
3244 action, where another site manager may have appeared to be
3245 paralyzed and waiting for direction from management or the
3246 government or both. So it's a good example of nuclear culture
3247 and safety culture being a challenge, but it also leads to,
3248 essentially, again, to talk about what Saida mentioned; Saida
3249 mentioned that is, that you have to have the trust, and if that
3250 trust isn't there, it's going be a, a real challenge no matter
3251 what your nuclear technology.

3252

3253 LESLIE: Thank you. Scott, any questions?

3254

3255 TYLER: Yeah, I'll go back to something that, Scott Tyler, on
3256 the Board, something that, that Dan brought up, which I
3257 appreciated, regarding transportation on the WIPP site. And,

3258 and, I know for the US facilities, whatever we build or wherever
3259 it is, there'll be long transportation routes. And to some
3260 degree that may be a little bit of an elephant in the room, that
3261 it's very easy to, to stop those kind of transportation things.
3262 So maybe to Piet, and I know, Saida, it's a little different in
3263 Sweden, most of the waste is transported by ship. Were there
3264 issues, Piet, in Switzerland, on the transport side, moving the
3265 waste from your interim facility, or what lessons can we learn
3266 from that?

3267

3268 ZUIDEMA: Well, I should say, most of transportation, or looking
3269 at the distances, was going to and back from reprocessing,
3270 actually, and then to the interim storage, but actually, no.
3271 There is, it's a non-issue. I mean, people want to be informed
3272 about it and they want to know about the routes, where it goes,
3273 but, it's a non-issue. And --

3274

3275 ENGSTRÖM: And, and I --

3276

3277 ZUIDEMA: And if you ask why, I think that you can put it into
3278 perspective, you know, we have Switzerland, you're probably
3279 aware, we are in a way in the middle of Europe, so a lot of

3280 traffic, you know, to Italy, et cetera, goes through to
3281 Switzerland. Also, you know, high-risk transports. And people
3282 are aware of that. And in that sense, they are able to put it
3283 into perspective. And I think that that's always very important.
3284 Put things into perspective.

3285

3286 ENGSTRÖM: I think we had, I said that we had eight feasibility
3287 studies, among those that were two that are inland and would
3288 require transport in trains to the harbor. And I can absolutely
3289 say that I was happy we lost them in the process, because we
3290 started to have some very, very difficult and negative
3291 discussions about transport. And it was short distance, few
3292 kilometers from the presumptive final repository to the harbor.
3293 And it was extremely worrisome for the people in the vicinity
3294 because they're not used to it.

3295

3296 LESLIE: Steve?

3297

3298 BECKER: Steve Becker, Board. So, we haven't really touched a
3299 lot on transnational or international issues thus far, but
3300 obviously when countries border other countries or are near
3301 other countries, those issues would come into play. I'm

3302 wondering if you could touch upon that aspect of siting and
3303 consent, if you will?

3304

3305 ZUIDEMA: Well, you, you probably saw it, our high-level waste
3306 repositories are at the border to Germany, and that obviously
3307 needed some explanation. And there again, I say two things.
3308 First of all, there are very good geological reasons why they're
3309 there. And the second thing, what is also very good that, you
3310 know, with our neighboring countries, we have formal groups that
3311 discuss nuclear issues, also waste disposal. So, the thing is
3312 there was, since I would say 40 years, there's continuously
3313 these comm talks. So, one is fully aware of one another, and one
3314 really takes the other side very serious. And what then was done
3315 that Switzerland decided to formally involve the neighboring
3316 communities of Germany in the process.

3317

3318 So, they cannot vote on, on Swiss things, but in the discussions
3319 on siting the surface facilities, they were fully involved,
3320 equally as Swiss members. And then also the German side set up
3321 also a safety review group that followed our work, that reviews
3322 everything. They come to the Swiss public meetings, so they are
3323 full part of the system, except that they're not Swiss citizens

3324 and not living in Switzerland, so they cannot vote on Swiss
3325 things, but otherwise they're a full partner.

3326

3327 And then, culturally speaking, and probably I shouldn't say
3328 that, but you see differences, and that is Germany hardly ever
3329 votes, and we vote every third weekend. And so, the good news,
3330 what is very interesting in Switzerland, you vote and you are
3331 against something, your neighbor is in favor of it, and one of
3332 the two is the winner or the loser. And we are used to lose once
3333 in a time, and you accept it. And that was different, you know,
3334 in Germany they were not lost, used to lose, and so they
3335 couldn't accept that now the site is there. And in Switzerland,
3336 once you have decided, you know, that's then business as usual.

3337

3338 ENGSTRÖM: Switzerland is not within the European union, but all
3339 the other countries that are within the European Union, they
3340 have to follow the SBU Convention. So, prior to giving your
3341 application to the government to construct repository, you have
3342 to talk to your neighbors and choose which ones are your
3343 neighbors. You can be very, you know, narrow in your choice of
3344 friends or neighbors, or you could be generous.

3345

3346 And unfortunately, I had this, proposal from the government to
3347 be very generous. So, we took, you know, Russia, Poland,
3348 Germany, and of course all the Scandinavian countries, Denmark,
3349 of course, and we had consultations with them the Environmental
3350 Impact Assessment, and it has to do with trans boundary impact.
3351 And we had lots of problems with guess who, not being very
3352 politically correct here either, Germany, and Germany has its
3353 problems with discussions in their own country about nuclear,
3354 but they almost transferred their discussion into Sweden with
3355 our discussions about there were no transboundary impact to
3356 them, and it took us one more year just to actually try to
3357 resolve that. So, we have, by European law, you have, we have to
3358 ask our neighbors, but we can choose which one are neighbors.
3359 And of course, you do that and you have to, and most of our
3360 countries have been very constructive about it and gave very
3361 good demands and want to be informed along the way with the
3362 project. But we had a sling of important debate about no nuclear
3363 into Sweden through the participation of Germany, which cost us
3364 one more year in the project.

3365

3366 LESLIE: Piet?

3367

3368 ZUIDEMA: Probably I can add something to this, you know,
3369 because it jumped just into my mind. So, in Switzerland we have
3370 then also some for, to discuss formally issues. And in these
3371 for, our neighbors are invited as an equal partner, as the Swiss
3372 people. And there we had an similar, interesting thing. So, you
3373 know, we have, several neighbors, but from this one was really
3374 interested, Germany, for good reasons. And then Austria,
3375 although they're really away, but, you know, if you offer them a
3376 seat on the table, you only can win. That's my thing, what I can
3377 say.

3378

3379 ENGSTRÖM: I agree.

3380

3381 ZUIDEMA: Because they're involved and then they see who is
3382 affected really, and they hear, "Well, we can live with that,"
3383 then they're a bit more careful with complaint.

3384

3385 ENGSTRÖM: Yeah.

3386

3387 LESLIE: Thank you. Nathan?

3388

3389 SIU: Yeah. So, Nathan Siu, the Board. All of you've talked
3390 about the importance of face-to-face engagement, and I heard
3391 also from Lisa, the vast number of ways you try to do that. Did
3392 you try to measure in any way, or assess the effectiveness of
3393 engagement, and identify things that work better than others, or
3394 was it you just have to do it all?

3395

3396 ENGSTRÖM: No. I can give two examples of, I said earlier that
3397 females are more negative to those facilities, or anything
3398 nuclear actually, than males, or we cannot discuss it here, but
3399 there are, there is research about that. And they would not come
3400 to our meetings. So, what do we do? Where, where we tried to
3401 identify where do they work mostly? They work in schools, they
3402 work in hospitals, and we went and made an agreement with the
3403 head of staff in the hospitals and told them that, "We, could we
3404 come and meet your nurses for lunch, we bring lunch, and
3405 meanwhile they're eating their salad, we can talk to them about
3406 this project and they can invite us another time if they have
3407 questions," and it worked very well. We did the same thing with
3408 farmers. They have their, when we have meetings, for instance,
3409 they have work to do, their work is not nine to five, so we go

3410 to them, we go and we have, we can maybe have two or three
3411 farmers in somebody's kitchen and we talk to them.

3412

3413 And we, we could actually measure that. For instance, in the
3414 municipality of Tierp, when we started, 45% were fairly positive
3415 to engage, and the rest was in opposition. When we left the
3416 municipality, 67 were very positive to continue the
3417 contribution. The rest was actually more, they don't know
3418 exactly, and very few were negative. So, we could see exactly
3419 that, we could measure, and we could see it also through the
3420 meetings and discussing with people that interacting with them
3421 would shift their positions in different ways. And most of the
3422 time, for us, it was actually on the positive side. Because most
3423 of the time, actually, being negative, that's why I, what I say
3424 to when they be in this, comments about women being so negative,
3425 and I said it's, I don't, I would not like to see that as being
3426 negative. It's, in a society, it's like a car, you need gas.
3427 Most of the time it's males, well-educated engineers, they want
3428 to see these things develop and women are cautious, but the car
3429 needs both a brake and gas. And that's why in a society you have
3430 to listen to the enthusiastic ones and you have to listen to the
3431 ones that have some anguish about your project. And that's how

3432 you build actually an acceptable consensus about the decisions.

3433 And that, we see, we could measure it and we could see it

3434 through the years.

3435

3436 LESLIE: Brian?

3437

3438 WOODS: Yeah, Brian Woods, Board. We've talked an awful lot

3439 about communication and especially face-to-face communication.

3440 But I'm kind of curious, I mean, has, you know, social media and

3441 those types of communication, has that played a role at all

3442 currently in your efforts to kind of reach out to your

3443 communities?

3444

3445 ENGSTRÖM: Very little, at the end, actually, because, mind you,

3446 we started somewhere in the '80s, so social media were not, so I

3447 think it did later, but we didn't do only face-to-face. We had,

3448 for instance, a paper that we produced four times a year, and

3449 it's been distributed to each household in the community, and it

3450 talks about them. You talked about how this will impact the

3451 community, you make interviews with the mayor about the project,

3452 and you have, I mean, it was a paper that everybody read, so

3453 that was a very important tool. We had a monthly letter that you

3454 can actually subscribe to, and you know exactly what's happening
3455 with the project. So there were other tools, not only face to
3456 face, but I, social media came, I think, sometime in the mid-
3457 '90s, a little bit. Now if, if we are to do something now, for
3458 instance, I think we'll have to address that very much.

3459

3460 LESLIE: Saida, thanks. Piet, let me have the prerogative to
3461 bring someone else to the table. Tissa?

3462

3463 ILLANGASEKARE: Yeah, thank you very much. Tissa Illangasekare,
3464 Board member. Thank you very much for your presentation. So, I
3465 have a question. This question come from two of the issues of
3466 uncertainty. So, it was also the issue of overestimated
3467 benefits. Sometime you'd sell it to the community, those two
3468 issues. The first, I'll give an example in hydrology, I'm a
3469 hydrologist. We have article, hundred-year flood. Some people
3470 always think that a hundred-year flood is a flood that would
3471 come every hundred years. We had one. We are not have it
3472 tomorrow. So how do you communicate issues of uncertainty? The
3473 geology, so much uncertainty. Engineering has uncertainties in
3474 their design... safety factors. How do you communicate this to the
3475 public, depending on the, like you said, perspective, different

3476 people have perspective about different things. How do you
3477 communicate a risk or uncertainties to people the way they
3478 understand their own frame of references?

3479

3480 ENGSTRÖM: I can say that you really choose the easiest question
3481 of them all. This, actually, this is the most difficult one. I
3482 say something and I leave it to Piet to continue. It's very,
3483 very hard. If you talk about uncertainty, people in their head,
3484 they think unsafe. You talk about uncertainty and you try to
3485 explain it. You say, for instance, because there are in
3486 uncertainties, because in Sweden, for instance, we will be
3487 having lots of ice ages, so this copper canister is five
3488 centimeter thick. We could make, we could actually have a safe
3489 one with one and a half, but given the uncertainties in the
3490 future, we put in a bigger margin of five. And then we've taken
3491 a good position for future unknown and uncertainties, but this
3492 is one of most difficult discussions. There were that's where
3493 Allan, this person, that safety analyst at SKB, and his team,
3494 were very useful because they can explain how they do their
3495 scenarios and how they build the uncertainties with bigger
3496 margins in the constructing the final repository, but it is very
3497 difficult.

3498

3499 ZUIDEMA: Well, in my view, the first thing is that one should
3500 be very clear what we can and what we cannot. We cannot predict
3501 the details about the future. And I think that's the very first
3502 thing that is very important. So, it's very important that we
3503 bound the future, and my personal experience is, and I'm
3504 negative, scientists are always just too optimistic. They think
3505 they know and they don't know. And we always, I always had to
3506 insist, make it broader, you know, make your scenarios broader,
3507 because we just do not know. And I think in that sense it's very
3508 important that we are not overly, you know, confident. And the
3509 second thing I think is, at least in Switzerland, it's geology.
3510 You know, we go into geology because geology has a very nice,
3511 very long history book. You know, you can look back for many
3512 millions, tens of millions, or even more back, and you see what
3513 happened, and then you can say, if you now look one million
3514 years in the future, look what happened in the past. What will
3515 change, what will not change, and what effect will that have on
3516 the geological barrier?

3517

3518 I just can say there we have really nice examples in
3519 Switzerland. It's probably too, takes too long to explain it,

3520 but I think that's why we say "geology has spoken." We look for
3521 stable situations, and situations where you have excellent
3522 barrier functions and that gives the confidence. You know, it's
3523 the system that gives the safety, not our calculations. That's
3524 always what I have to say. It's the system that makes it safe,
3525 not our calculations. The calculations only show how well we
3526 understand it.

3527

3528 LESLIE: Nathan?

3529

3530 SIU: Yeah, I'd like to follow up on that. I mean, you guys have
3531 been involved in this decades, you've been talking to people
3532 about uncertainties and about risk. You've talked about putting
3533 things in the context. Have you seen any change over the years
3534 about how people receive, understand the messages, or has it
3535 been pretty constant example? Example, Saida, you said,
3536 "Uncertainty equals unsafe." Are people becoming more accepting
3537 that there are uncertainties or is it, I'm curious?

3538

3539 ENGSTRÖM: Yeah, they are, actually. I can tell you how, how the
3540 subjects of interest shifted over these decades. To begin with,
3541 it was really safety. Yeah, uncertainties, because there was

3542 this fear and they were, they asked this question, typical
3543 question, can you guarantee? And you would be very unwise to
3544 say, "Yes, I," we, you try to discuss the uncertainties with
3545 them. And these questions, hanged on, hang on for many, many
3546 years. They would ask about safety and the uncertainties and,
3547 why are you here and not there? And you would bring the geology
3548 and all that. When the subject became more of implementing, it
3549 came in, in implementing phase, the concern by the people was
3550 actually noise and the construction. You could attend the
3551 meeting for three hours and nobody would talk about safety or
3552 uncertainties or safety analysis. They would work about when you
3553 are constructing, how many lorries are, are, will be dashing by
3554 this road, by me. And, they will be talking about the housing
3555 situation. Could we, our children, could they buy houses when
3556 all of you from Stockholm would come here and buy houses to
3557 higher prices and it will ruin the market. We had new set of
3558 questions. Of course, the original safety question did not
3559 disappear completely, but I must say they will maybe take 10% of
3560 one meeting. Meanwhile, the other question here and now would be
3561 more prominent. So, we, we've seen this shift over these two and
3562 a half decades in dialoguing with the municipalities.
3563

3564 ZUIDEMA: Well, you are right, but now I go more again to the
3565 other thing. What is more, you know, I really take now a
3566 historical perspective. In the early days, everything was about
3567 consequence analysis releases. And today, much more emphasis is
3568 put on by there are no releases. So, it's much more looking, not
3569 necessarily at releases, but at the performance of the barriers.
3570 And I think that's very important so that you choose systems
3571 that are very, or where your reliability of predicting or
3572 assessing the performance of a barrier is important. And I think
3573 in Sweden you had that also, some then people that make life
3574 difficult for you because these experiments, you know, copper
3575 corrosion, for example.

3576

3577 But so, it's less the releases and the consequences, but it's
3578 really the system as such that you know what contributes how and
3579 how reliable to retaining the nuclides in place. And there, I
3580 think one has to say sometimes nature is not really nice to us.
3581 So, the real radiotoxic elements have low mobility and that
3582 helps, you know, all the actinides, they stick like hell. You
3583 know, they, they, they're a nightmare in some experiments
3584 because they stick everywhere. And so, in that sense, these are
3585 the very basic things where you see where safety comes from. And

3586 I think that's very important to understand and to convey these
3587 messages.

3588

3589 ENGSTRÖM: And to give them time also to bring up the subject
3590 once, and once again. And I mean, you could hear the same
3591 question from the same people in ten meetings, and it's because
3592 they want to hear what are you going to say this time, so.

3593

3594 LESLIE: Well, I'd like to thank the three of you for having a
3595 great discussion and responding to the many questions. And I'll
3596 turn it back to Nathan to tell us what's next.

3597

3598 SIU: What's next is lunch. So, I think we'll try to get back on
3599 schedule. We're just a couple minutes off. So, if I can ask
3600 everybody to return at 12:55, and we will reconvene. Thank you,
3601 again.

3602

3603 [End AM Session]

3604 [Begin PM Session]

3605

3606 SIU: Okay. I think we're ready to start. We had a little bit
3607 late start on our lunch, so apologies to those who are online,

3608 but we are rolling now. Next three presentations will be from
3609 DOE, and the first one will be by Natalia Saraeva and Angelica
3610 Gheen talking about lessons learned from international practice.
3611 Natalia, please.

3612

3613 SARAEVA: Thank you. All right. Good afternoon. I'm Natalia
3614 Saraeva, Team Lead for consent-based siting. I'm joined today
3615 virtually by my colleague, Angelica Gheen. She's the lead for
3616 our international collaboration coordination, and also, she's
3617 been leading the studies we've been doing in both international
3618 and domestic exemplars. So I will start this presentation by
3619 saying a couple of words, and then I'll turn it to Angelica for
3620 more in-depth discussion, and then we will go to Question and
3621 Answers, and Marissa Bell, Social Scientist on our team, has
3622 lots of international experience that she has joined the DOE who
3623 will also participate in Q&A. So, again, thank you for the
3624 opportunity to be here today at this really important workshop.

3625

3626 As you will learn from our presentations, we've been
3627 incorporating international best practices and lessons learned
3628 for a long time in our process, and we continue doing so.
3629 However, we use different venues and mechanisms to do so and how

3630 this type of workshop provides a really unique experience to
3631 hear from our colleagues and also engage in some additional
3632 discussions. So, okay.

3633

3634 All right, so first of all, as I mentioned, incorporating
3635 international best practices and lessons learned is something
3636 that we've been doing for many years, and the metaphor was used
3637 here before under the previous speakers as reinventing the
3638 wheel, right, so we're not doing that. We're just trying to
3639 build our process works for this country, for the people of this
3640 country, but also looking at our colleagues and partners and
3641 incorporating those elements that worked well or also learning
3642 from those that didn't.

3643

3644 So how they've been leveraging the experience, so, first of all,
3645 our consent-based siting process document builds on the Blue
3646 Ribbon Commission on America's Nuclear Future, the Report to the
3647 Secretary, that recommended consent-based siting, and the
3648 Commission looked really deeply in both domestic and
3649 international experiences. And as a former staff member of the
3650 Blue Ribbon Commission, I can attest that the Commission and
3651 staff spent a lot of time studying those best practices and

3652 lessons learned. Commission members and staff also went to see
3653 different programs, and their engagements with conversations was
3654 the program management, but also was over for possible... it was
3655 like local communities as well.

3656

3657 So, again, of course, a lot has changed since the Blue Ribbon
3658 Commission report had been issued, right, and the process has
3659 evolved, right? There have been so many updates and changes. For
3660 example, they've been also looking at, like, Spain, but they
3661 took a pause in developing their interim storage... consolidated
3662 interim storage, right? Other countries made significant
3663 progress including Sweden, including Switzerland, and those
3664 countries not represented here today. Oh, Canada too, right? So
3665 that is why it's really important for us to continue learning
3666 and incorporating those best practices in our processes. So this
3667 is why we are continuing analyses of those programs, and
3668 Angelica will talk in more details about how exactly we're doing
3669 that.

3670

3671 We also built other studies and other reports. The consent-based
3672 siting process builds not only on the Blue Ribbon Commission
3673 Report and not only on the public feedback that was extensive,

3674 but in other studies. We often go to the Nuclear Waste Technical
3675 Review Board reports that we find really helpful, and thank you
3676 for publishing updates, and, again, what we do is not
3677 duplicating what you've already been doing, but adding to that.

3678

3679 In addition, our staff at DOE and contractors at national labs
3680 has a deep knowledge in prior international experiences, so I'll
3681 just give a couple of examples. So, Marissa Bell here, she was
3682 prior to DOE, joining DOE, she spent several years in Canada
3683 studying their spent nuclear fuel management approach and
3684 especially from the environmental justice perspective. As a team
3685 member who is not in this meeting, Vincent Talenti, he studied
3686 the Finnish program for several years as a social scientist, and
3687 we have multiple staff and contractors in national labs who have
3688 been consulting in other programs and who worked in other
3689 programs, and some of them are still consulting in those
3690 programs, especially in Canada.

3691

3692 And before I turn this to Angelica, I wanted to mention that
3693 there's so many similar themes that have been emerging through
3694 this workshop, right, and once we continue talking about what
3695 we're trying to do, and especially tomorrow when we talk about

3696 in details about the consent-based siting process, you will see
3697 that a lot of those similar themes are only reflected in our
3698 roadmap for the consent-based siting process, and I just named a
3699 couple of examples. So, it's an absolute commitment to safety of
3700 people in the environment. It is a need to rebuild and maintain
3701 trust. It is commitment to informed consent. It is a flexible,
3702 adaptive, and collaborative process that centers communities'
3703 needs and concerns, but this process doesn't... it's not one size
3704 fits all. It might look different depending on what community
3705 you go, right? It's the tricky nexus between the implementer
3706 there, the federal government, and in our case the implementer
3707 is the federal government, and also, the local governments and
3708 the communities, right?

3709

3710 Also, the process that centers listening and providing genuine
3711 opportunities to learn more throughout the process, right, and
3712 also an opportunity to say no and walk away, right? Even if you
3713 started considering it, there's a common theme that a community...
3714 at a certain point communities should have a way to walk out and
3715 say, "Well, we considered it, but we're not interested." And
3716 there are many more common themes. There are outcome differences

3717 too, right? They are caused by different geographical,
3718 political, cultural, and many other issues, right?

3719

3720 But anyway, so... but when you see those similar themes, right, in
3721 our process, they then form by two parts. One part is our
3722 extensive public feedback that we received, and to me it's,
3723 again, it's what was mentioned before in previous discussions
3724 today. It is the fact that there are a lot of similarities
3725 between how people feel about spent nuclear fuel management,
3726 right, and the second factor in why there are so many
3727 similarities is because we've been learning from our
3728 international partners. So, without further ado, I'll turn this
3729 to Angelica to talk about it in more details of what we've been
3730 doing, especially this fiscal year and our next plans for future
3731 fiscal years, and then we'll go to Q&A. And Angelica, you will
3732 need to tell me when to switch to the next slide.

3733

3734 GHEEN: Perfect. Thank you. Okay, we're on the correct slide.
3735 Okay, thank you so much, Natalia. Hopefully everybody can hear
3736 me okay, and you'll stop me if I'm too quiet or too loud. Hello,
3737 everyone. I hope you had a great and productive lunch. As
3738 Natalia mentioned, my name is Angelica Gheen, and I serve as the

3739 International Lead for our office at the Department of Energy.
3740 We're taking many concrete steps, as Natalia mentioned, towards
3741 leveraging the experiences of our international colleagues, and
3742 one way we are accomplishing this is by creating easy-to-
3743 navigate resources for use by our staff, and we're developing
3744 in-depth case studies of international experiences that
3745 alongside the current status of each of these countries spent
3746 fuel management programs create resources that we can use really
3747 easily. For Fiscal Year '23 these country reports are going to
3748 include Canada, the UK, Switzerland, Finland, and Germany, and
3749 these resources are meant to provide both insights into the
3750 current and historical sociopolitical environment of these
3751 countries alongside basic technical information.

3752

3753 In addition to each of these case studies, single-page summaries
3754 which we're referring to as "fact sheets" are being developed,
3755 and they're going to act as these quick primers on a nation's
3756 current status. These fact sheets will help DOE and national lab
3757 staff increase their general awareness of each nation's spent
3758 fuel management programs. For Fiscal Year '24, one proposal is
3759 that these studies be taken even further and get expanded to
3760 include candid interviews with both stakeholders and

3761 decisionmakers telling us what worked and what didn't work. We
3762 recognize that each of these nations have their own unique
3763 cultural and political environments, but we feel that there are
3764 still really significant lessons that we can learn from them and
3765 in looking up, as I said, both things that worked and things
3766 that didn't work so well.

3767

3768 We also acknowledge that international efforts are mainly
3769 focused on disposal facilities at the moment, whereas our
3770 current focus is on a federal consolidated interim storage
3771 facility. Nevertheless, given that the siting of waste
3772 management facilities in general has proven to be less of a
3773 technical and more of a sociopolitical challenge, these
3774 international experiences are still going to provide really
3775 valuable insights to us. Okay, next slide please.

3776

3777 Perfect. In addition to those case studies, just this year we've
3778 signed two bilateral instruments for cooperation that have been
3779 focused on spent fuel management. In April of 2023, the
3780 Department of Energy and the Ministry of Economic Affairs and
3781 Employment of Finland signed a Memorandum of Understanding, or
3782 MOU, on nuclear energy and nuclear waste management. This MOU is

3783 going to foster further cooperation on nuclear energy
3784 technologies, nuclear waste management, public engagement, and
3785 small modular reactors, and nuclear safety.

3786

3787 In July we had the kickoff meeting for that MOU with VTT
3788 Technical Research Centre of Finland who's going to be acting
3789 as the lead on the Finnish side. We discussed a lot of possible
3790 avenues for joint research endeavors and how VTT can work
3791 collaboratively alongside a lot of our staff at the national
3792 labs. As Lisa Frizzell mentioned earlier this morning, in May of
3793 2023 DOE and the Nuclear Waste Management Organization, or NWMO,
3794 of Canada signed a Statement of Intent, or SOI. This SOI
3795 concerns cooperation on spent nuclear fuel and waste management
3796 specifically, so it's very focused on our office, and we're
3797 really excited about it. The SOI will support mutual learning,
3798 information exchange on consent-based siting processes, science
3799 and technology programs, engagement activities, and joint
3800 technical studies.

3801

3802 The kickoff meeting for that SOI was also held in July, I had a
3803 very busy July, and we discussed pathways forward and how both
3804 parties can maximize their mutual learning. Some of the proposed

3805 activities in the future were site visits for both sides and
3806 discussions with local communities in Canada that have been a
3807 part of their process siting there. Additionally, NWMO let us
3808 know that they just completed their roadshow in the Great Lakes
3809 Basin in support of their siting efforts in the region. They
3810 visited multiple stakeholders throughout the Chicago, Detroit,
3811 and Ann Arbor areas. They met with a wide range of local
3812 representatives including state representatives and local
3813 academics, and in the spirit of our agreement later this week
3814 NWMO is going to provide our office with a debrief on these
3815 outreach efforts. We're very interested to hear about what kind
3816 of response they received and what additional lessons we can
3817 take away from those. Next slide please.

3818

3819 Perfect. In addition to these bilateral instructions, both the
3820 federal and lab staff are maintaining active international
3821 presence by serving on technical working groups and attending
3822 meetings of various international organizations including the
3823 Nuclear Energy Agency, or NEA, and the International Atomic
3824 Energy Agency, IAEA. Examples of participation include the IAEA
3825 Technical Meeting for Municipalities with Nuclear Facilities and
3826 the NEA Forum on Stakeholder Confidence. Other examples of our

3827 active participation include work with the Joint Convention and
3828 the NEA Radioactive Waste Management Committee, or RWMC. A lot
3829 of acronyms with these international groups.

3830

3831 Additionally, our office is a member of and active participant
3832 of the International Association for Environmentally Safe
3833 Disposal of Radioactive Materials, a mouthful, or EDRAM. This
3834 year our office is going to be hosting the EDRAM Annual Fall
3835 Meeting at Argonne National Laboratory in the Chicago area, and
3836 this will mark only the third time the United States has served
3837 as host in this meeting in the past decade. As hosts we're going
3838 to have a chance to demonstrate advancements at the lab as well
3839 as to our nuclear power plant and its spent fuel storage
3840 facilities, and hopefully it is spent fuel with fuel.

3841

3842 Our office will also participate in the EDRUM Community Working
3843 Group, or Communications Working Group—I apologize—which we find
3844 very useful, and it allows us to better utilize our
3845 international colleagues as resources. This year I'm going to be
3846 serving as the delegate on the NEA Forum on Stakeholder
3847 Confidence, and I'm going to ensure that that information and
3848 the discussions at the forum are properly disseminated to the

3849 rest of the team, and this year's meeting is going to be in
3850 October and held in Cincinnati, Ohio.

3851

3852 To ensure all staff has awareness and access to the learning
3853 opportunities that are provided by attending these kinds of
3854 meetings and technical groups, post-conference trip reports are
3855 required of all staff attending off-site meetings. These reports
3856 are used to confirm points of interest and any topics that are
3857 going to spark further investigation for our office. We also
3858 attend international conferences and workshops in addition to
3859 these meetings and working groups such as the workshop on
3860 Management of Spent Fuel, Radioactive Waste and Decommissioning
3861 in SMRs or Advanced Reactor Technologies, the IAEA International
3862 Conference on the Safety of Radioactive Waste Decommissioning
3863 Environmental Protection and Remediation, and the Waste
3864 Management Symposia.

3865

3866 Through our continued participation in the international
3867 community and by learning from our international colleagues, we
3868 can gain valuable insights into how we should develop our
3869 program and how we can maintain our adaptability and build
3870 flexibility into that program. We're very grateful for our

3871 international colleagues for their cooperation and international
3872 organizations such as the IAEA and NEA for providing us the
3873 platforms for this dialog and collaboration. Okay, that's it for
3874 me.

3875

3876 SIU: Okay. Thank you very much, Natalia and Angelica. I think
3877 we are now open for questions.

3878

3879 BECKER: Steve Becker, NWTRB Board. Thanks, Angelica, for a nice
3880 overview of the international dimension. Couple of quick
3881 questions. In your international nuclear waste management
3882 program analyses, to what extent are those focused on consent-
3883 based siting related issues, and to what extent are they just
3884 kind of general in their approach?

3885

3886 GHEEN: Great question. So, they are both. So really there is a
3887 section in those case studies to parse out how a specific nation
3888 has chosen to focus their program, so if it's something similar
3889 to consent-based siting or consent-based "sitingesque"-like,
3890 like in Canada, for example, that is clearly drawn out. If it's
3891 not so much a consent-based siting program, that is also made
3892 clear in the case studies.

3893

3894 BECKER: And to what extent is your dive into the material deep
3895 enough that you can have subcategories? I'm thinking of things
3896 like communication approaches, engagement approaches, metrics
3897 used to assess the success or failure of various components. Are
3898 you doing a deep enough dive that you'll be able to break things
3899 out into different subcomponents?

3900

3901 GHEEN: So when we were originally scoping this work, that was
3902 definitely a consideration in a direction that we wanted to go
3903 into, however, we did find that in order to provide even a basic
3904 overview as well as that information it created a kind of very
3905 in-depth, very lengthy resource which we originally viewed these
3906 as almost quick primers, like a 10-to-15 page you could read
3907 through it and then have a meeting with somebody who is involved
3908 with the program in that nation or is a representative of that
3909 nation and be able to speak in an educated way about what it is
3910 they're doing and ask them questions that are relevant to our
3911 program.

3912

3913 So, we kind of... we're still including those, but less in depth,
3914 and so the proposed work for Fiscal Year '24 is definitely more

3915 focused in that direction. We're also hoping that as opposed to
3916 looking into publicly available sources by doing one-on-one
3917 interviews with people who are involved in the programs in
3918 these... in different nations we'll be able to get kind of an
3919 insider's view and more of a frank conversation into what worked
3920 and what didn't work.

3921

3922 BECKER: So, it sounds as though the analyses are almost
3923 preparation for some of these in-depth interviews that will look
3924 behind the scenes, so to speak.

3925

3926 GHEEN: I think we're definitely looking at it in an iterative
3927 way, so that way there will be multiple components of this
3928 resource that depending on your needs you can utilize. If you're
3929 just... if you've got a meeting in five minutes, that's what the
3930 fact sheet is for. You can go boom, boom, boom, one page real
3931 quick. If you've got more time, you've got the 10-page. If you
3932 really want an in-depth, then hopefully those interviews will
3933 lead to something else.

3934

3935 BECKER: Thank you.

3936

3937 SARAIEVA: And I would add to that that, you know, we just
3938 started this fiscal year, and as Angelica mentioned, it is an
3939 iterative process, but it's also iterative in the way to say,
3940 "Okay, we can do this much, but what all are our immediate needs
3941 and what works or doesn't work?" right, because definitely you
3942 can write pages and pages and pages, but as Angelica mentioned,
3943 we live in a really quick-pace environment sometimes, and if you
3944 need some information quickly, right, you don't have time to go
3945 through a lot of pages. So that's why we came up with these
3946 ideas of, like, having a lengthy report and then having the
3947 short internal fact sheets.

3948

3949 BECKER: So, it would really be a distillation, if you will, of
3950 what worked and what didn't work.

3951

3952 SARAIEVA: Both. Yeah. Yeah, yeah, yeah.

3953

3954 BECKER: Okay. Thank you.

3955

3956 SARAIEVA: But it doesn't include only the siting processes. It
3957 includes the information on overall programs, and it doesn't

3958 only include like disposal or storage, when available. It
3959 includes some additional information on those programs.

3960

3961 BECKER: Thank you.

3962

3963 TYLER: Scott Tyler with the Board. Thanks to both of you. Kind
3964 of just refresh me. I may have missed it a little bit, but the
3965 anticipated audience for these one-pagers and, say, 10 or 12
3966 pages, what is your anticipated audience outside of, again, your
3967 group? Who else do you see using these in the next... in a short
3968 period of time?

3969

3970 SARA EVA: I mean, anticipated audience is, you know, myself and
3971 my management, right, and our team, but, again, this is... we just
3972 started, so depending on the interest, right, we do sometimes
3973 get questions from other offices, right, that we help them to
3974 answer, right, a direct item of information, so the audience
3975 might extend a little bit. But it's also... we can do a lot, but
3976 it's also a matter of resources.

3977

3978 TYLER: Of course. Yeah.

3979

3980 SARA EVA: Yeah. [Chuckles]

3981

3982 WOODS: Brian Woods with the Board. Thank you again for the
3983 presentation. I'm just kind of curious. I know you're early in
3984 the process, right, and I think for the case studies you've only
3985 completed, I think, Canada and Switzerland, but is there
3986 anything that kind of jumps out right now that, hey, this is a
3987 lesson learned that it makes sense? I mean, is anything come
3988 right now that really seems obvious to you it's a good lesson
3989 learned from just what you've done so far?

3990

3991 SARA EVA: You mean from today's discussion or overall?

3992

3993 WOODS: Oh, overall.

3994

3995 SARA EVA: Overall?

3996

3997 WOODS: Yeah.

3998

3999 SARA EVA: I'll start, and I'll let Angelica and Marissa to add.
4000 So, we've been... we've been looking at international programs for
4001 a long time, right, so of course, yes, there were a lot of

4002 things that have jumped out or things that we've thought about
4003 and then thought, "Well, you know, it worked well in other
4004 countries." And as I mentioned, you know, our process was built
4005 on the findings of the Blue Ribbon Commission and other studies,
4006 right, and they took a really in-depth look at the Swedish
4007 structure, for example, and the Canadian one. When we were
4008 developing consent-based siting originally in 2015 to 2017,
4009 right, there were also a lot of conversations between the
4010 Department of Energy and, like, for example, international
4011 partners, right, so those mechanisms like EDRAM, but also at
4012 some conferences there's so many things like these waste
4013 management organizations.

4014

4015 And you can see a lot of similarities in our processes like the
4016 phased process, right, or the stepwise. So, the Nuclear Waste
4017 Management Organization calls it phased and adaptive management,
4018 right, so we call it consent-based siting, but it is phased and
4019 adaptive, right? So, there's multiple examples that we've been
4020 talking a lot today. During the first half of the meeting it was
4021 like.. oh yeah, what Saida said, right, and this was resonated,
4022 but you could say this as well, "That's good, but it might not
4023 work in our country" because.. in their country, as they

4024 mentioned, they have almost no unemployment, right? So, in our
4025 country, for example, we've heard from the public comments loud
4026 and clear that we should be providing funding for those
4027 interested to participate in our process. In Sweden they didn't
4028 include funding until they selected the site, right? There were
4029 many... probably can talk here for the whole day... things that
4030 resonated. I think that just... that works well, right, but we
4031 here have a different, like, cultural environment, for example.
4032 I don't know. Angelica or Marissa?

4033

4034 GHEEN: I was going to let Marissa go, but I can go. I think
4035 what's interesting, kind of what Natalia was saying, is that
4036 you'll see the same issues pop up and the same themes pop up for
4037 both international... our international exemplars that we're
4038 looking at and our domestic exemplars, and kind of the same
4039 issues popping up again and again. Constant iterative
4040 communications, making sure that the communities feel like they
4041 are involved in the decision-making process, and making sure
4042 that you are responding to any and all comments from the local
4043 communities. Things like that are popping up from international
4044 experiences, regardless of kind of what their strategy is, even
4045 if it's not what we would call, like, adaptive phased or

4046 consent-based siting, but we also see that with... spoiler alert...
4047 for the next talk, the domestic exemplars.

4048

4049 BELL: Those are excellent points. I don't know if the
4050 microphone is up? Yeah? Okay, so I'll just sort of add from my
4051 perspective, and I'll caveat this with in a former life I was an
4052 academic who studied these processes, and now I'm [chuckles]
4053 part of the sort of team implementing them, so I'll say that
4054 anything that I say in the next minute or so will be from that
4055 perspective.

4056

4057 But I think there are some really interesting things that I've
4058 learned through my former research and also things that I see
4059 reflected in our process before I came on board and things that
4060 we are doing now and just from today some of the mirrors in sort
4061 of lessons learned. I think one interesting thing from the
4062 Canadian process is... and I primarily... so there's two communities
4063 left that are in the process. I primarily looked in Southern
4064 Ontario, so at the South Bruce County sites that are within the
4065 vicinity of a nuclear power plant, so I think that some of that
4066 is mirrored.

4067

4068 So spoiler alert for tomorrow's discussion of social science
4069 integration, but that's work that we're doing to understand the
4070 perspectives of current host communities, and I think from my
4071 sort of analysis and research on the Bruce County is that being
4072 in the proximity of a nuclear power plant and being a self-
4073 identified nuclear community is very influential on perspectives
4074 and perceptions. And so that will influence, and so now we're
4075 sort of looking at how that influences what we're doing as we go
4076 out to do community engagement in the U.S.

4077

4078 I think that from former studies of looking at how being a
4079 nuclear community or even just sort of local political dynamics
4080 and local cultural elements, in the Canadian case there was a
4081 low-level waste siting process at the same time as a high-level.
4082 How did that influence things? It created a lot of confusion
4083 that I heard from community members, and so I think that, you
4084 know, there are things that we can do to sort of understand what
4085 is the local context and sort of the influence of local
4086 geography as well as, of course, state and national geography
4087 and sort of how international processes influence our own.
4088

4089 And I think specifically on the... and I'd love to... it may be
4090 another spoiler alert for sort of panel and how environmental
4091 justice influences sort of siting processes in other countries,
4092 but at least for the Canadian siting process, the way that
4093 they've managed sort of the interweaving of indigenous and
4094 scientific knowledges and the sort of immense care that they've
4095 taken into developing indigenous policies that we can then take
4096 and sort of understand in our preparation for tribal engagement,
4097 I think that, you know, that's been, you know, incredibly
4098 influential.

4099

4100 I did say [chuckles] in the next minute, but I've probably
4101 spoken for a couple of different minutes, and I could also, you
4102 know, keep talking at some of the interesting things that have
4103 emerged, I mean, even on the nuclear community site like some of
4104 the nuclear Oasis hypothesis discussion that came out of
4105 studying Sweden, so I think that there's immense potential for
4106 seeing those implications and how we then learn from those and
4107 integrate them and fold them into our process as we go on.

4108

4109 SARAEVA: And to conclude the answer, it's often not what, it's
4110 the how, right? It's how we can transfer the best practices to
4111 the same issues given the differences that we have.

4112

4113 BECKER: Steve Becker, Board. Actually, it's just a suggestion.
4114 I noticed that you're looking at literature and case studies and
4115 plan to do interviews. Don't know if you've already done so, but
4116 if you haven't, it might be useful to look at transcripts from
4117 Board meetings that have occurred before because we've had quite
4118 a number of meetings with international experts from different
4119 countries speaking, and inevitably someone will ask the
4120 question, what lessons have been learned? What has worked well?
4121 What hasn't worked well? So, you might be able to save some time
4122 in your digging by mining those transcripts of previous
4123 meetings.

4124

4125 SARAEVA: Thank you. Yeah, that will be a great addition to the
4126 interviews. Yeah.

4127

4128 SIU: Quick one. Nathan Siu, Board. You mentioned the number of
4129 countries that you're looking at in your case studies. Are you
4130 looking at any Asian countries?

4131

4132 SARA EVA: Angelica, what are our plans?

4133

4134 GHEEN: Yes, Japan is on our short list for next fiscal year,
4135 but it didn't make the cut for this fiscal year. So proposed for
4136 this next fiscal year. Also, I have suggested South Korea as
4137 well, but we're still down selecting, so... oh, perhaps Marissa
4138 has had conversations. I'm not sure.

4139

4140 SIU: She's shaking her head no. [Chuckles] Thank you.

4141

4142 SARA EVA: And we always have the Nuclear Waste Technical Review
4143 Board Report to go to if we need some information, so it's
4144 really comprehensive, so...

4145

4146 LESLIE: Bret Leslie, Board staff. Thanks for a nice overview. I
4147 think one of the things that may be a challenge for you is in
4148 the birth of any new program there's a huge learning curve, and
4149 it's not necessarily the process, but organizationally, are you
4150 looking at how you can learn lessons from people like Saida and
4151 Piet in the sense of, you know, here's where they stubbed their

4152 toes? Not just... you know, not looking outwards, but looking
4153 inwards. Have you thought about that?

4154

4155 SARAEVA: It's a great question. We've been in more in-depth
4156 conversations with Nuclear Waste Management Organization, right,
4157 and we for sure will be really interested to take different
4158 looks at the SKB and Nagra. One caveat or elephant in the room
4159 is we are... the federal... we are a part of a big federal agency,
4160 right? So, there are really incredible things that Nuclear Waste
4161 Management Organization are... or our colleagues are doing that we
4162 have... we can do, but we, you know, we have longer lead times or...
4163 and other challenges.

4164

4165 One example would be our funding. It depends on the annual
4166 congressional appropriations, right, so the Nuclear Waste
4167 Management Organization could be, I believe Nagra, they have
4168 access to more streamlined funding that... and they don't need to
4169 go to Congress every year. I would say that for the last three
4170 years we have been really lucky and thankful to the Congress
4171 for, you know, for generous appropriations, and we hope it will
4172 continue.

4173

4174 LESLIE: Bret Leslie, Board staff. Another question. I recognize
4175 that you're doing the fact sheets and these synopses I would say
4176 and primarily focusing on as an internal product, but I think
4177 what Saida said was people are people, and I think it would be a
4178 lost opportunity if you weren't thinking about using and
4179 parlaying that into your consent-based consortia. Just an
4180 observation.

4181

4182 SARA EVA: Thank you.

4183

4184 BECKER: Steve Becker, NWTRB Board. Apropos the subject people
4185 are people, are you contemplate the interviews that will take
4186 place with presumably experts and key stakeholders, what will
4187 you be looking for? Will you be looking for primarily for
4188 governmental players? Will you be looking to tap key
4189 stakeholders on the community side? How are you thinking about
4190 approaching the interview process?

4191

4192 SARA EVA: Angelica?

4193

4194 GHEEN: Do you want me to take that one, Natalia?

4195

4196 SARAIEVA: Mm-hmm.

4197

4198 GHEEN: Okay, great. We're conceptualizing it, although we're
4199 still... this is still proposed Fiscal Year '24 work, so one of
4200 the things that we've tossed around is looking at people who
4201 were involved in the siting process on the people... those who
4202 wish to do the siting, but then also on the other side get the
4203 perspective of people who are part of the community or who are
4204 players and stakeholders for potential sites. So, we really want
4205 to see a full scope of perspectives there because the way an
4206 implementor is seeing a situation is not necessarily the way
4207 that somebody in a community perceived that same interaction.

4208

4209 What we're really hoping comes out of the interviews is, like I
4210 said, a little bit more of a peek behind the curtain because we
4211 have access to publicly available information, but we would like
4212 is a little bit more frank discussion, bilateral frank
4213 discussions, which is one of the reasons why we want to make
4214 sure that these documents stay internal where we can get real
4215 information on, you know, what strategies made sense and why
4216 people think that perhaps they didn't work out the way they
4217 thought or maybe there unforeseen circumstances that happened

4218 after they implemented them, and we can kind of get that insider
4219 information, if you will.

4220

4221 BECKER: Thank you.

4222

4223 TYLER: Scott Tyler with the Board. I was just thinking, what
4224 are your plans with respect to these documents, and how will
4225 they be transmitted or will there be interaction with the
4226 consortia, the recently-funded consortia participants and how...
4227 can there be a two-way street there to: a) inform that group,
4228 but then perhaps have that group inform your reviews of the
4229 international programs?

4230

4231 SARA EVA: Sure. So, there's a caveat that we'll have a more in-
4232 depth discussion about consortia tomorrow.

4233

4234 TYLER: Yeah.

4235

4236 SARA EVA: I'd say that the consortia... so first of all, we're
4237 creating a resource library for the consortia to have access to
4238 different materials that we have. We also don't want to
4239 overwhelm consortia and for them to let us know what they would

4240 like to see because if you see, you know, a resource library
4241 with a thousand documents, you might be lost, right? So we are
4242 trying to... so the Department of Energy will be part of this
4243 consortia, right, and for us partner means a dialog, right? Part
4244 of it... part of the dialog is identifying and listening to the
4245 consortia needs, so as a part of it, again, these particular
4246 documents were created this fiscal year with some limited
4247 resources, and they were created, again, for our needs. So
4248 consortia will have access for additional information, but,
4249 again, the prime purpose for those documents was just internal.

4250

4251 TYLER: Okay. I guess I would just suggest based upon some of
4252 the discussions we had here today, this morning, that I think... I
4253 think some of this information is really valuable to communities
4254 to see how has it been successfully done before, and I think any
4255 way you can transmit that information to the consortia to get
4256 them started... you know, again, it's a fairly simple way to
4257 start, and it's a positive way to start in general. I think it
4258 would be really helpful. Just a suggestion.

4259

4260 SARA EVA: Absolutely.

4261

4262 BECKER: Steve Becker, Board. I'll just second that and say that
4263 as these and other informational resources are created in the
4264 course of developing this consent-based siting process, it might
4265 always be useful to look at something and say in addition to the
4266 purpose that we initially envision, how might we make effective
4267 use of this down the road in terms of informing and engaging
4268 communities and meeting likely information needs? It could very
4269 well be that something like this can be parlayed into a very
4270 valuable resource. Not just for the consortia, but ultimately
4271 for communities and interested members of the public. So, just
4272 something to keep in mind, and I'm seconding my colleagues
4273 comment there.

4274

4275 BELL: I would just add that when it comes to the consortia, at
4276 least one of them, I think Keystone, it has some partners from
4277 the UK, and I think some of the other consortia have partners
4278 from the NWMO, and so I think there will be some kind of
4279 organic, sort of creational collation of international
4280 experiences that the consortia themselves are recognizing are
4281 important, so I think that will be really exciting to see how
4282 that develops and unfolds.

4283

4284 And to that also, and Angelica would probably speak to this
4285 better than I can, so I'll have it over to her, but in terms of,
4286 I think, the IAEA and the sort of... I think it's a collection of
4287 municipalities across internationally that are sort of looking
4288 to collaborate and learn from each other in that regard, so I
4289 think to tap into that and to figure out how we can support, you
4290 know, in the future as we have communities volunteering at a
4291 future stage of the process how can communities support each
4292 other in sort of a... in a peer-to-peer kind of learning way
4293 without necessarily... so, yeah, Angelica, you probably know the
4294 exact title of the group that I'm referring to, but it's not
4295 coming to my mind.

4296

4297 GHEEN: I'm not sure it has a technical name yet, but you are
4298 exactly correct because in the technical meeting for
4299 municipalities that the IAEA hosted last year there was at the
4300 end this idea of the ECA getting together with, or the Energy
4301 Communities Alliance, getting together with their international
4302 colleagues and counterparts and creating kind of a global
4303 community alliance. I think it was something along those lines
4304 that they were calling it.

4305

4306 I haven't heard anything since then, but they were very excited
4307 about it at the meeting, I was very excited about it, and I
4308 know... I will certainly make sure that we hear more about it as
4309 information comes out about it.

4310

4311 ILLANGASEKARE: Tissa Illangasekare, the Board. Thank you for
4312 your presentation. So, I have a question related to the, like, a
4313 social scientist and behavioral scientist. You probably have
4314 recent models and hypothesis where you can test and learn from.
4315 So, my question is that in the field of environmental justice
4316 you have some track record and experience and lessons learned.
4317 Are there any lessons learned which can be applied to this from
4318 the point of view of bringing, I guess, the theories of social
4319 sciences or behavioral sciences?

4320

4321 BELL: Yeah, that's a great question. In terms of... so if I'm
4322 understanding correctly, what... from the social science
4323 perspective of what can we learn from environmental justice
4324 lessons, [chuckles] there will be a whole presentation on that
4325 [chuckles] in, yeah, in a couple of hours, so I'm happy to delve
4326 into that and dive into it. I will be doing so.

4327

4328 But broadly, I mean, I think internationally I think that, you
4329 know, environmental justice, I mean, there's a lot that we can
4330 learn from internally in sort of environmental justice movements
4331 and racial justice movements that have even, you know, just sort
4332 of taken hold in the past couple of years, but internationally,
4333 like I said, looking at how other countries have looked at
4334 indigenous processes. Not just Canada, but I understand Finland
4335 and Australia too, like, there are sort of ways that we can look
4336 at, you know, look at those processes and understand what
4337 lessons we can take and bring back.

4338

4339 I'm actually... and that's actually a question that I was going
4340 to, and probably will still pose in the panel later on, but
4341 specifically about, you know, like, the environmental justice
4342 challenges that we have in the U.S. environmental justice comes
4343 out of the Civil Rights Movement. We have a particularly unique
4344 history in the U.S. of, you know, slavery and sort of ongoing
4345 racism discrimination, and to understand how similar processes
4346 of marginalization or oppression or inequality how those are
4347 happening with our, you know, partners in international spaces,
4348 I think that there is an opportunity for us to sort of

4349 understand a little bit more about some of those challenges and
4350 what we can bring back to our process.

4351

4352 LESLIE: Bret Leslie, Board staff. I'm building a little bit on
4353 Scott's question, which is how those lessons learned
4354 internationally can be shared with the consortia. Have you
4355 thought about, you know, like the Forum for Stakeholder
4356 Confidence and the Integration Group for the Safety Case just
4357 came out with a report just weeks ago on building confidence in
4358 the face of uncertainty that consolidates and puts into 13 pages
4359 kind of, here are the lessons learned. Is that part of what you
4360 think you're going to be providing as resources to the
4361 consortia?

4362

4363 SARA EVA: I mean, the short answer is yes. Those types of
4364 resources absolutely can be available to help a consortia
4365 member. To my earlier point as to the question of, like I said,
4366 timing and when to put it, right, again, we don't want to
4367 overwhelm our consortia members with providing a lot of
4368 information. We provide some information upfront, but we will be
4369 building up the library as we continue engaging with the
4370 consortia members.

4371

4372 But I would also want to say that, you know, some of the
4373 consortia members are now partners just to come to this meeting,
4374 so that's... it really speaks to the interest of learning about
4375 the international programs and then their best practices. And I
4376 cannot see who is online, but I would not be surprised if some
4377 of the members are online too.

4378

4379 SIU: Any other questions? I know, Steve, you [chuckles], you're
4380 actually done? Okay.

4381

4382 [Laughter]

4383

4384 BECKER: For the time being.

4385

4386 [Laughter]

4387

4388 SARAIEVA: He's saving himself for the next meeting.

4389

4390 SIU: So, no, Marissa, you won't have to talk for multiple
4391 minutes [chuckles]. Okay, I do believe that we're a little bit
4392 early on this, but thank you again, and I think actually Natalia

4393 and Angelica are still up, and now we're going to be talking
4394 about the domestic lessons. You have a few more extra minutes
4395 [chuckles].

4396

4397 SARAIEVA: All right. Thank you so much. Again, for those of you
4398 online maybe just joining I'll introduce myself again. My name
4399 is Natalia Saraeva. I'm Team Lead for consent-based siting with
4400 the U.S. Department of Energy, Office of Nuclear Energy. I'm
4401 joined today virtually by team member, Angelica Gheen who is not
4402 only our lead for coordinating international engagements, but
4403 also has been leading the work into looking into both
4404 international and domestic best practices and lessons learned.

4405

4406 So, I'll start our presentation, and I'll turn it over to
4407 Angelica for a deeper dive on the activities that we've been
4408 doing recently. So just like in our international analysis of
4409 their programs, right, incorporating the domestic best practices
4410 has been ongoing activities, right, and I mentioned that our
4411 process documents builds on different stages including the Blue
4412 Ribbon Commission on America's Nuclear Future, and the
4413 Commission looked at the Waste Isolation Pilot Plant that was

4414 discussed earlier today. We also looked really heavily at the
4415 MRS that had been discussed here today and other experiences.

4416

4417 Just like with international experiences, we do have staff
4418 members and also members of the staff at our national ops and
4419 contractors with wealth of experience in domestic processes,
4420 both related to spent nuclear fuel management, but also outside
4421 of nuclear experiences. One of my staff members, social
4422 scientist Vincent Talenti, he spent several years studying WIPP
4423 before he joined the Department of Energy, and he started the
4424 deciding processes. We also have multiple other staff members
4425 that know this program real well. Again, there are multiple
4426 other experiences and processes that we've looked at, and
4427 without further ado, I'll turn it to Angelica to talk about the
4428 activities we conducted in the past fiscal year.

4429

4430 GHEEN: Thanks, Natalia. Hello again. So wonderful to see all of
4431 you. The Department of Energy... let's go ahead and switch to the
4432 next slide.

4433

4434 Perfect. So, the Department of Energy is working to identify
4435 lessons learned from previous domestic cases of siting

4436 facilities that have encountered a large amount of social
4437 scrutiny. We cast a really broad net to identify domestic siting
4438 cases and gather best practices and lessons learned that could
4439 be applicable to a consent-based siting of an interim nuclear
4440 waste storage facility. The objective is to collect information
4441 from a variety of sectors, not just the nuclear sector, and
4442 consolidate that knowledge.

4443

4444 We down selected exemplars from the biological, nuclear, solar,
4445 petrochemical, mining, and wind sectors, so we cast a very broad
4446 net, like I said. Each site was selected based on the scope of
4447 the project and the size of the public response to that project.
4448 We compiled reports using a mixture of case studies and
4449 interviews from people who were involved. Now, unlike the
4450 international exemplars' projected work for next fiscal year, we
4451 were talking about interviews of people who were doing the
4452 siting and communities that were involved at the sites
4453 themselves, but these interviews only involved people who were
4454 involved in the siting of the project. So it will be one... one-
4455 dimensional scope.

4456

4457 A summary report of all the lessons learned is going to be
4458 developed at the end of the fiscal year once all of the site
4459 reports have been compiled, and we're going to utilize that to
4460 more clearly guide our future processes. Next slide please.

4461

4462 So here are the assessments that have completed drafts so far
4463 this fiscal year. We've completed in the nuclear sector the
4464 Office of the U.S. Waste Negotiator which we heard a little bit
4465 about this morning, in the biology sector, National Bio and
4466 Agro-Defense Facility at Kansas State University, and in the
4467 solar sector the Spotsylvania Solar Energy Project in
4468 Spotsylvania County, Virginia which is the largest solar
4469 facility east of the Rockies. So, let's go through a little bit
4470 of what we've learned from each of these examples. Next slide
4471 please.

4472

4473 So in the biology sector we've got the Biosafety Level 4
4474 Facilities, so you'll hear me say BSL4, so that just stands for
4475 Biosafety Level 4. There's four biosafety levels-BSL1, BSL2,
4476 BSL3, and BSL4-BSL4 meaning that there are pathogens that are
4477 present that have no prophylactic or treatment in humans. So
4478 that's what we're talking about here today, a BSL4 facility.

4479

4480 So, in 1999, Kansas State proposed the need for a biocontainment
4481 facility to work on threats to United States agriculture. Later
4482 that year, the Kansas State President provided testimony to the
4483 United States Senate about an agricultural biological weapons
4484 threat, and those efforts resulted in Kansas State building a
4485 biosecurity research institute which is a BSL3 agricultural
4486 facility to conduct research on potential biothreats to food
4487 crops, food animals, food, and people. In January of 2006, the
4488 Department of Homeland Security launched a national effort to
4489 find a location to site a National Bio and Agro-Defense Facility
4490 and proposed a foreign animal disease laboratory to replace an
4491 aging facility that was located on Plum Island in New York
4492 State.

4493

4494 The biocontainment facility would be predominately a BSL3 and a
4495 BSL3 agricultural space, but it would be the first United States
4496 laboratory with a BSL4 animal room and labs, and these will
4497 study zoonotic lab livestock diseases for which there is no
4498 treatment for it in people. The three-year selection process
4499 resulted in the selection of a 46-acre site on Kansas State
4500 University campus, and the ownership transferred to the

4501 Department of Homeland Security in December of 2012. It was \$125
4502 billion dollars used for funding this facility, including \$307
4503 million dollars from the State of Kansas and \$5 million dollars
4504 from the City of Manhattan. Now, that's Manhattan, Kansas and
4505 not Manhattan Island in New York. This 25% contribution to the
4506 total cost of the facility highlights that there was a unique
4507 federal, state, and local partnership involved in the siting of
4508 this facility.

4509

4510 So, some key details here. It was funded by the Department of
4511 Homeland Security, but operated by the Department of
4512 Agriculture. It was the first United States laboratory with a
4513 BSL4 livestock space. Public engagement wise, there were
4514 multiple public meetings and opportunities for public comment.
4515 Representatives from Kansas State went to public meetings at
4516 other BSL4 sites to get an idea of what was working and what
4517 wasn't as far as communication to their local communities, and
4518 they invited public and private sector advocates to speak at
4519 public meetings prior to the siting. Public comments on
4520 environmental impact statements were considered prior to any
4521 decision making, and there was a large amount of local support

4522 including county commissioners, city, and the Kansas State
4523 Governor.

4524

4525 Over time as the opposition evolved it became more organized,
4526 and it became much less local and much more national. To
4527 prioritize the local community, Kansas State University
4528 management made a point of answering any and all questions or
4529 comments that came from verified Kansas residents, so that way
4530 they were inundated with comments coming from all directions,
4531 but they could make sure they could prioritize those that came
4532 from local concerned citizens. So eventually the national level
4533 opposition became their primary opponent here.

4534

4535 So, clearly this is not the siting of an SNF storage facility,
4536 but here is what we saw as the main characteristic similarities
4537 and differences between siting this biosafety facility and the
4538 siting of a storage facility. Siting a biosafety facility in the
4539 middle of cattle country exposed this program to really intense
4540 local, regional, and national opposition. Some similarities to
4541 the CISF siting include that there was significant perceived
4542 risk to the environment and to the local population, risks of
4543 concern to many, but that were either technically unrealistic or

4544 very low probability. There was significant local opposition.
4545 The national intervenors worked really hard to block the
4546 acceptance of any of the proposed options under consideration,
4547 and they would move from one public meeting to another public
4548 meeting in order to gain support.

4549

4550 This effort required engagement with as many people as possible,
4551 as often as possible, with multiple meetings, electronic
4552 outreach, one-on-one engagement, etc. There was a flexibility in
4553 communication and messaging that intervenors saw as vitally
4554 important to the success of this. There were large costs,
4555 significant licensing, and regulatory hurdles for numerous
4556 agencies, and there was a need to get local and state political
4557 support early and to work continuously to keep that support by
4558 communicating frequently with appropriate staff and politicians.

4559

4560 So, those are all similarities. Some key differences are that a
4561 BSL4 contains pathogens that are very deadly for which... for
4562 diseases that for which there were no cure or prophylactics. Any
4563 impacts from contact occur very quickly and will spread very far
4564 rapidly. The consolidated interim storage facility will have a
4565 larger footprint, whereas this facility had a pretty small

4566 footprint, and a consolidated interim storage facility will have
4567 significant routine rail traffic, whereas this facility did not
4568 have any noticeable increase in vehicular traffic at all.

4569

4570 So, what can we learn from the siting of this BSL4 facility?

4571 Well, much of the success of this project was due to the
4572 significant personal attention that was paid to all the
4573 communities being evaluated for siting, and much more attention
4574 was paid to the opponents than to the advocates. This project
4575 was extremely labor-intensive for Kansas State staff. They gave
4576 over 100 presentations to interested parties on the plans for
4577 the BSL4 facility during the evaluation and even more later as
4578 they updated the public on the status of the construction.
4579 Special attention was paid to elected officials at all levels of
4580 government early in the process and continuously throughout it.

4581

4582 Flexibility and adaptability and communications and messaging
4583 were vitally important, and the communications were very labor-
4584 intensive with frequent personal interface with small groups,
4585 many one-on-one meetings, and meetings with local organizations
4586 such as the local Lions Club and religious groups. Next slide
4587 please.

4588

4589 Okay, nuclear sector. A little bit closer to home. The Office of
4590 the United States Nuclear Waste Negotiator, we got a little bit
4591 of history on this already, so I'll go quickly through it. It
4592 was created as an independent federal agency through amendments
4593 in the Nuclear Waste Policy Act. The Office was authorized for
4594 five years originally, and Congress extended operations for two
4595 additional years. The Office's mandate was to identify a state
4596 or tribal volunteer disposal site and to negotiate the terms of
4597 hosting facility on behalf of the United States government. The
4598 Office was closed before any sites were formally established,
4599 however, they engaged with several state and tribal
4600 representatives about their interest in potentially hosting a
4601 site. This case offers many valuable lessons in the successes
4602 and failures of attempting a voluntary consent-based siting
4603 process.

4604

4605 Some additional details. Primary lessons learned were waste
4606 siting is a highly politicized issue, and political support as
4607 well as the current political climate can impact the success or
4608 failure of any initiative. Political hierarchies complicate the
4609 support for a facility in the decision-making process once you

4610 want to go bottom-up because those approaches are critical for
4611 gaining community support, however, you also want to go top-down
4612 because that's the key to gaining state level support.

4613 Opposition to hosting an interim storage facility, particularly
4614 at the state level, seems to stem from a lack of trust in the
4615 federal government.

4616

4617 Some characteristics in similarities and differences between the
4618 Nuclear Waste Negotiator and our process is as a nuclear waste
4619 siting initiative the Office of the Nuclear Waste Negotiator
4620 shares many obvious similarities with the siting of our facility
4621 and the consent-based siting process specifically as it was an
4622 attempt: a) at developing and executing a voluntary siting
4623 process, it was primarily focused on siting interim storage
4624 facility rather than a long-term disposal site, it operated in a
4625 similarly complex social environment with negative public
4626 perception regarding spent nuclear fuel and a lack of public
4627 trust in the siting and disposal process, and it shared some of
4628 the same actors that we're dealing with in stakeholder groups
4629 and regulatory processes.

4630

4631 Some key differences are that national priorities have shifted.
4632 Yucca Mountain is no longer considered a viable solution. The
4633 legal and policy frameworks that the Office was operating under
4634 have changed leading to policy support and a political mandate
4635 for an interim waste facility. The political... or the climate
4636 change concerns have shifted national priorities, and the goals
4637 around energy production and support of clean energy solutions
4638 and potentially opening opportunities to shift public opinion
4639 and interest in nuclear as an energy source has increased, and
4640 energy equity environmental justice plays a much more
4641 significant role in public and political discourse about
4642 infrastructure in waste management which has shaped new ways of
4643 thinking about how the potential impacts and burdens of hosting
4644 a site and the importance of defining and operationalizing
4645 consent in the siting process.

4646

4647 So, what can we learn from the Office of the Nuclear Waste
4648 Negotiator? Firstly, careful and thoughtful engagement is
4649 essential for a program's success. A successful program will
4650 need expertise and should aim to engage and nurture support
4651 across all sectors in government, academic, and industry. A few
4652 well-positioned supporters can make a really big difference in

4653 the success or failure of a project. The wrong type of
4654 engagement or engagement that goes poorly can severely
4655 negatively affect a program or project. A consent-based siting
4656 program should be adaptive and change... adaptive to changes in
4657 policy, politics, culture, society, and funding because it's
4658 impossible to predict what will happen decades into the future.
4659 A program will need to remain flexible and be able to work
4660 towards a firm, long-term goal while adapting to changes within
4661 the system.

4662

4663 Developing a balanced siting process that is locally driven
4664 while also gaining support from state level leaders is critical.
4665 We have to consider the state and regional impacts that the
4666 facility might have and balance the needs of the wider
4667 communities against the needs of the communities facing the most
4668 immediate impacts of hosting the facility. Creating a process
4669 that shifts agency to state and local communities provides
4670 resources to enable the shift and will increase the chances of
4671 success. Giving communities resources and flexibility to conduct
4672 their own research that they deem necessary according to their
4673 own needs and their own concerns will lead to better decision-
4674 making outcomes for potential host communities.

4675

4676 Local communities also need to have agency and resources to
4677 advocate on their own behalf, and developing and disseminating
4678 robust educational resources on scientific information regarding
4679 the safety and societal impacts of interim waste storage will
4680 help to counter any misinformation and misunderstandings and
4681 increase understandings and acceptance. Next slide please.

4682

4683 Solar project. So, this solar project was located in
4684 Spotsylvania County, Virginia. It was termed the largest solar
4685 project east of the Rockies and is more than 6,000 acres and
4686 under construction on former timberlands in northern Virginia.
4687 This project received approval from the Virginia State
4688 Corporation Commission in 2018, and Microsoft is the project's
4689 largest corporate investor having purchased a substantial
4690 percentage of this farm's output. This project has faced
4691 widespread community opposition, including concerns with limited
4692 employment opportunities, erosion and runoff, impact on water
4693 resources, impact on rural heritage and landscape, and actual
4694 versus claimed carbon offset benefits.

4695

4696 The siting of a large-scale solar facility shares similarities
4697 with the siting of any nuclear facility. They're both clean
4698 emergency sector... in the clean energy sector industry, they
4699 operate in similarly complex political and social environments
4700 with many people and policies nationally and locally, and they
4701 both have the potential to raise concerns about long-term
4702 environmental impacts of the facility.

4703

4704 However, some key differences are that nuclear energy and spent
4705 nuclear fuel potentially have greater negative associations than
4706 solar energy does, there's more public concern over the public
4707 health impacts of nuclear than solar, the legal and policy
4708 frameworks that each industry operates under is different in
4709 terms of siting and permitting, large-scale solar facilities are
4710 privately owned and operated and driven by private industry,
4711 whereas current consent-based siting efforts for a consolidated
4712 interim storage facility are driven by the federal government
4713 through the Department of Energy, and energy equity
4714 environmental justice means different things in each context.
4715 For example, in solar EEEJ it might be related to energy access
4716 or cost savings, whereas for consolidated interim storage
4717 facility siting it may pertain to unbalanced burdens.

4718

4719 So, what can the Department of Energy learn from the
4720 Spotsylvania solar facility? Well, the most important thing that
4721 came from this exemplar is that gaining and not losing community
4722 trust needs to be done upfront and throughout the project. This
4723 project took a multi-pronged approach to this. They took the
4724 time to listen and to make space for all community feedback
4725 addressing all questions that were raised by community members
4726 and trying to understand and evaluate the project proposal and
4727 impacts on their lives in the community. In the Spotsylvania
4728 case, the project developers had public meetings, and they
4729 allowed them to go hours past the intended timeframes to make
4730 sure that everybody's concern was heard and everybody's
4731 questions were answered.

4732

4733 Secondly, they take concrete actions that demonstrate a
4734 commitment to investing in the local community and community
4735 wellbeing. In the Spotsylvania exemplar, the establishment of a
4736 community fund was an invaluable tool for building trust in the
4737 community. They offered similar kinds of programs providing
4738 funding and/or resources for helping a community meet its needs
4739 and improve its quality of life.

4740

4741 Looking for local experts rather than bringing in outsiders,
4742 this is going to help build trust in the information that's
4743 being shared and goodwill with the local experience and
4744 knowledge being viewed as legitimate and valuable. They
4745 developed a robust outreach strategy. This recommendation is in
4746 part to begin early community knowledge building and trust, but
4747 also in anticipation of some form of opposition that's going to
4748 come into the process and being prepared for that opposition.
4749 Designing a wide reaching out... amount of outreach tools such as
4750 a public-facing website that speaks to a variety of audiences
4751 across local, regional, and state levels and that can
4752 communicate information clearly to multiple education levels.

4753

4754 Outreach should be proactive in engaging community members,
4755 particularly those with the most potential to be impacted by the
4756 project. Outreach should happen at the earliest stages in the
4757 project to understand the needs and concerns and begin building
4758 trust and to share correct information. Outreach should target a
4759 variety of stakeholder groups who hold sway and can provide
4760 input on different aspects of the social and economic life of
4761 the community. Finally, you want to demonstrate that the project

4762 will be a net win for the community. This can be achieved by,
4763 for example, supporting substantial local economic development,
4764 advancing career in technical training, providing tax benefits,
4765 or providing... or improving environmental quality or social life.
4766 Next slide please.

4767

4768 So that's what we have finished for the fiscal year so far, but
4769 there are still three more reports due at the end of this year.
4770 One is focused on the petrochemical manufacturing sector called
4771 the Sunshine Project. That's in the St. James Parish, Louisiana,
4772 and it's slated to be one of the world's largest petrochemical
4773 manufacturing plants. The second is in the mining sector,
4774 Western Vanadium—[chuckles] I've been talking too much today,
4775 can you tell—and Uranium Mill. Green River Industry Park in
4776 Utah, and it will be... it's not... this is not yet completed, so
4777 we're still in the siting project for this particular exemplar,
4778 but it would be the second uranium mill in the United States.
4779 And then the wind sector, Urban Turbine Installation in
4780 Milwaukee.

4781

4782 Again, each of these sites have been selected based on a scope
4783 of the project and the side of public response to the project,

4784 and we believe that there is a lot more to be learned from these
4785 remaining exemplars, and we're really interested to hear what
4786 additional recommendation comes from these further studies.

4787 Thank you.

4788

4789 SIU: Thank you, Angelica and Natalia. Okay, I'm sure we have
4790 questions. We do. Steve?

4791

4792 BECKER: Do we want to start with somebody else?

4793

4794 SIU: No, I don't. [Chuckles]

4795

4796 BECKER: All right. It's becoming a ritual here. Steve Becker,
4797 NWTRB. Thanks for that really interesting presentation. Each one
4798 of those case studies was, I think, valuable in and of itself
4799 and really interesting in terms of the range of lessons learned,
4800 the things that worked, the things that didn't work. So, my
4801 first question is, is your ultimate plan as you complete more of
4802 these case studies to in effect create a matrix where you look
4803 across all of the case studies in order to draw overarching
4804 conclusions? Will you be looking not just at the individual
4805 cases, but rather cumulating the findings from all of this work?

4806

4807 SARA-EVA: I'll start, and then Angelica can add. So, we do plan
4808 to next year to provide a report that would tell the findings,
4809 and, Angelica, do you want to talk a little bit more about the
4810 plans?

4811

4812 GHEEN: Yes, absolutely. So, as you can see, there were running
4813 themes throughout all of these, and we expect for the remaining
4814 exemplars we're also going to see similar running themes. So,
4815 what we've requested is a summary of lessons learned so we can
4816 create kind of an idealized project. In an idealized world, how
4817 would these people who sited these various projects, what would
4818 they recommend that we absolutely do? What would they recommend
4819 we don't do? What would they recommend that we be weary of and
4820 condense that since there's so many similarities? We also have
4821 Carmen Mendez on the line. She is one of the primary
4822 investigators on this project, so she can also speak to more
4823 specific questions that any of you may have.

4824

4825 BECKER: Is she there right now?

4826

4827 GHEEN: Yes, she's on the line.

4828

4829 MENDEZ: Hi. Good morning.

4830

4831 BECKER: Hi.

4832

4833 MENDEZ: So, in regards to the matrix, that is actually the way
4834 that we're analyzing the information currently. We are still... as
4835 Angelica said, we have a couple of reviews that still need to be
4836 done on the exemplars, but we currently do have a matrix at
4837 least for all the exemplars, all the lessons learned, and we're
4838 accumulating what are the top priorities and the best practices
4839 we can make so that we can then compare and contrast and make
4840 sure that we arrive to an idealized solution.

4841

4842 BECKER: Very good. That will clearly be a useful product to
4843 have. May I follow up with a couple more quick ones? So, another
4844 question. As these case studies are prepared, this, in a sense,
4845 continues some of the discussion earlier on. What will be done
4846 with them? Obviously, they'll be of value to you as you're
4847 trying to identify key factors across cases, and what can be
4848 learned from domestic exemplars? What can be learned from
4849 international, maybe overarching conclusions, looking across all

4850 of the cases and the information gathered? What else are you
4851 going to do with them? Are these going to be, for example,
4852 publicly available? Are they going to be published? What's the
4853 ultimate plan for utilizing this very important set of
4854 documents?

4855

4856 SARAEVA: Again, I can start, and then have Angelica and Carmen
4857 to add. So, in terms of what DOE plans to do with those
4858 documents, again, this year we just started, and you can see the
4859 team has accomplished a lot, right, already, and there are three
4860 more reports that are due by the end of September. Right now,
4861 the internal reports we will... we still need to see what we can
4862 do with them, and we can consider making them eventually public.
4863 I have to say that with the Department of Energy we have a
4864 really rigorous process for the documents to become public,
4865 right, so right now we have some other documents—some other
4866 materials—in the review processes.

4867

4868 Again, we do want the team to finalize the individual studies
4869 and then combine a summary, and then also based on, like, the
4870 popular demand by perhaps consortia, we will decide what the

4871 next steps will be in terms of socializing this outside.

4872 Angelica, am I missing anything?

4873

4874 GHEEN: I just wanted to comment that when we were listening to
4875 the presentations by the consortia members about their proposed
4876 work that so many of these themes kind of popped out in that
4877 work, and so I'm excited to see that... it doesn't look like... it
4878 looks like we're definitely on the right track here.

4879

4880 BECKER: So, one last quick question before I turn things over
4881 to my colleagues, and this is one that I think all of the social
4882 scientists will enjoy. So, in discussing the solar case study,
4883 it was mentioned that one factor that came into play is that
4884 nuclear had greater negative associations than solar, so risk
4885 perception and some of the things around that certainly came
4886 into play. More generally from what you've done, how does the
4887 siting of facilities involving radioactive materials differ from
4888 the siting of other facilities? Are there other things that you
4889 have found thus far?

4890

4891 GHEEN: I will say that in the down selection, one of the
4892 reasons why the next siting projects that are on the list

4893 include a proposed uranium mill and a petrochemical facility is
4894 because we wanted to make sure that we were including things
4895 that would have opposition that was more focused on public
4896 health concern, perceived risk, so maybe some of that is
4897 perceived radioactive risk and maybe some of it isn't, but
4898 definitely from a different perspective than you would see in a
4899 solar farm, for example. When we were choosing the facilities I
4900 was like, "This is great. We're going to get great information
4901 on this," but it's not necessarily all the information that we
4902 need. Carmen, do you have any thoughts on that?

4903

4904 MENDEZ: I think those exemplars that we're working on are
4905 definitely going to give us a new perspective on the risk.
4906 That's not something that we looked at directly on the exemplars
4907 that we currently have, which is why we have those ongoing, and
4908 also the part of the work that we're looking forward to doing
4909 next year is including that risk perception by instead of just
4910 approaching the people that were involved in the siting,
4911 approaching the communities and understanding what was the risk
4912 perception in the siting firsthand from the people that were
4913 there when the siting was happening.

4914

4915 BECKER: So, this will be a good question for us to revisit,
4916 say, a year from now.

4917

4918 MENDEZ: Yes.

4919

4920 BECKER: All right. Thank you.

4921

4922 TYLER: Thanks. Scott Tyler with the Board. I just want to... now
4923 I want to encourage or support my colleague Steve's comment
4924 regarding prioritization of some of the aspects that... the wins
4925 and the losses, if you will, in the columns, and I would... just a
4926 suggestion, but I would begin to consider that process of how
4927 you are going to prioritize now rather than at the end of your
4928 report writing so that you can have some fairly clear metrics
4929 that each report is consistent so that you can prioritize and
4930 say what really are the critical factors and maybe think about
4931 critical path analysis and engineering design. What are the key
4932 things that either stopped a project or started... or made the
4933 project go and be able to clearly identify those?

4934

4935 If I read... I read your report on the Waste Negotiator, and it
4936 was quite clear in that report that there were some fundamental

4937 issues regarding the role of state governments and communities
4938 and the lack thereof of communication between communities and
4939 state governments, and that was... and, again, in reading the
4940 report, that was a fatal flaw. So, by being able to identify
4941 those fatal flaws early on and being consistent in all of your
4942 reports I think will be really helpful going forward in
4943 prioritizing the entire consent-based siting effort. Where do we
4944 really need to get consent? What are the critical paths that are
4945 in the way? Just a suggestion.

4946

4947 SIU: Nathan Siu, Board. I have a question. Maybe this is more
4948 kind of a social science question, and I'm not a social
4949 scientist, so I apologize upfront. But some of these lessons
4950 learned, some like, yeah, these are really good things to do,
4951 and they led to successes if success is meant to be the eventual
4952 siting of the facility, but I'm wondering, which ones of these
4953 are more important? Less important? Is there any way to
4954 evaluate?

4955

4956 For example, for the solar case they chose a particular way to
4957 transmit information to the stakeholders. There are many ways,
4958 of course, to do that, and presumably some are better than

4959 others, and maybe that depends on community, but I was wondering
4960 if there was any way to look at that and as a lesson learned to
4961 be able to say, "Okay, there's some things that work," and you
4962 can show and demonstrate that they work, and there are other
4963 things that sound good, but maybe aren't as useful in the big
4964 picture because you have limited resources obviously. It takes
4965 time to do all this stuff.

4966

4967 SARAEVA: That's really an important point, and I think part of
4968 it came through down select of the studies because the team
4969 focused on the six of them, but they considered much more, and
4970 Angelica and Carmen can let us know how many they considered in
4971 the beginning. One major difference that I know was mentioned is
4972 that non-nuclear facilities, right, they have different
4973 structure of permitting and regulations, right, so the
4974 Department of Energy is responsible for management of spent
4975 nuclear fuel and high-level radioactive waste by the law, right?
4976 So there's not such a thing when we talk about solar, solar...
4977 wind, or some other industries, right? But nevertheless... and I'm
4978 also not a social scientist, so nevertheless, there's a lot of
4979 similarities, and, again, from the perspective of perception of
4980 risk, perception of the impacts, right, and many other things...

4981 and I think the... Angelica, correct me if I'm wrong, but the
4982 biosafety facility was a recommendation of the Board that we
4983 considered.

4984

4985 GHEEN: It was.

4986

4987 SARA-EVA: That one was a no-brainer for our down selection
4988 process.

4989

4990 GHEEN: Yes, and I will say that as part of the proposed work
4991 for... and, again, proposed work for next fiscal year, is to look
4992 at it from the perspective of the communities that were in the
4993 sites that were selected. So that's, I think, going to give us
4994 that glimmer of information just because the people who were
4995 siting the facilities say, "XY and Z was why this was
4996 successful," though you might go into the community and they
4997 say, "No, that's not what... that's... they're crazy. That's not... it
4998 was because of blah, blah," you know, whatever it may be. I
4999 think we're going to be able to get a lot of really valuable
5000 information from talking to the community about what it is
5001 instead of people who were not a part of the community telling
5002 us what it was that was the secret sauce there.

5003

5004 In public health there's this saying, "Nothing about us without
5005 us," and I think it really goes into this work here, which is
5006 that we really need to be asking the community what it was that
5007 they felt like was the most impactful and the most helpful
5008 [chuckles].

5009

5010 SIU: Thank you. Yeah, that's definitely getting at it, and
5011 maybe it's just there are too many factors so that you can't
5012 just simply compare across the few case studies you've done to
5013 say, okay, based on this cross-study analysis you've decided
5014 that there are certain things that seem to be better on the
5015 whole.

5016

5017 SARAEVA: I think that's... that would be, you know, the need for
5018 consistent providing of information engaging the local
5019 communities, states, tribal governments, stakeholders, right? I
5020 think that would be consistent across and then the frequent
5021 engagement.

5022

5023 SIU: I mean, this is definitely getting into the how versus the
5024 what is.

5025

5026 SARA-EVA: True. Mm-hmm.

5027

5028 SIU: Steve?

5029

5030 BECKER: Steve Becker, Board. So speaking of the how, in the
5031 earlier presentation about international best practices and
5032 lessons learned, I noted that the process began with a
5033 presumably very comprehensive lit search, and I was wondering
5034 whether you've done a similar thing with respect to the domestic
5035 cases and lessons learned, and if so, if you have looked at the
5036 published literature and the case studies in that literature
5037 related to siting of, for example, hazardous materials
5038 facilities and so on. Is what you're finding in your current
5039 case studies fairly consistent with that?

5040

5041 GHEEN: Yeah, I think that that is a great question for Carmen.

5042

5043 MENDEZ: [Chuckles] Absolutely [chuckles]. So, yes, we started
5044 the process with a lead search to identify cases that we could
5045 look at and that were current enough that we would be able to
5046 find people to do it. We started out with an inventory of 71

5047 possible scenarios on six different non-nuclear sectors, and
5048 then from there we narrowed it down to the cases that we did.
5049 So, there's a broad variety of cases that we didn't do and that
5050 were not prioritized for several reasons.

5051

5052 The... regarding the lead search on the specific sectors, we are
5053 yet to look at the resource of our case studies against a search
5054 for, say, solar or windmill or whatever the facility is because
5055 we're waiting to see what the final report gives us and to get
5056 that perspective from the... sorry, from the communities if we're
5057 able to get that piece of work that is proposed. So, that piece
5058 is in our plans, but we have not yet looked at it, so I could
5059 not tell you if they are consistent with the literature findings
5060 yet. But the initial search, it was extensive as far as
5061 identifying the cases and the sectors that we wanted to look at.

5062

5063 BECKER: Okay, so ultimately what you will have will be your own
5064 case studies as well as a careful look at the existing
5065 literature.

5066

5067 MENDEZ: Once the case studies are complete, yes.

5068

5069 BECKER: Thank you.

5070

5071 SARAIEVA: And I would add that from what I've been seeing from
5072 the result of these studies is consistent with the themes that
5073 have been described in the document called The Facility Siting
5074 Credo. So those principles... and this document is based on the
5075 siting of some controversial facilities, right, including
5076 prisons and... it's a distilled summary, a really great read, but,
5077 again, a lot of emerging similar themes.

5078

5079 BECKER: Thank you.

5080

5081 LESLIE: Bret Leslie, Board staff. Thanks for a good
5082 presentation. I'm going to try to tie across both of the
5083 presentations, and I apologize in advance, but I didn't actually
5084 read the Nuclear Waste Negotiator deliverable. I was so busy
5085 trying to get this meeting together. But the point that I heard
5086 in the international was interviews. For the Nuclear Waste
5087 Negotiator deliverable, did that include interviews with past...

5088

5089 SARAIEVA: It did, and Carmen and Angelica can speak more, but I
5090 will also add that in the effort that's part related on nuclear

5091 management and preservation of some knowledge that we did have
5092 some additional interviews regarding the Nuclear Waste
5093 Negotiator. I know that this team has tapped into that resource
5094 as well, but, Angelica and Carmen, please speak up.

5095

5096 GHEEN: Yes, there were definitely interviews. Carmen, I think,
5097 has the names if you're interested.

5098

5099 LESLIE: Okay, and let me just follow up. There's also a podcast
5100 on recent lessons learned with the Nuclear Waste Negotiator
5101 that's been published. It's on the State of Nevada's website, or
5102 it will be shortly. The next thing that I kind of observed is...
5103 I'll probably be doing some on my facilitation discussion now,
5104 but, you know, Piet basically said listening was important. I
5105 didn't see in any of these slides that a key lesson learned was
5106 listening. I heard share correct information, whereas, you know,
5107 that implies a value that the information of the proponent or
5108 the person doing the thing had the correct information, so how
5109 do you think about these things when you're talking about what
5110 are the lessons learned?

5111

5112 GHEEN: That's an interesting point because it was that, I
5113 think, listening was not listed as one of the key lessons, but
5114 themes that did come up, especially with the Kansas State, the
5115 BSL4 siting facility, and the Spotsylvania facility, was mutual
5116 learning which was understanding what the communities' concerns
5117 were and then going back in and addressing those concerns as
5118 opposed to just presenting whatever information you wanted to or
5119 giving them information, as you said.

5120

5121 It was, let's talk to... talk to the Cattlemen's Association,
5122 let's talk to the ranchers, let's talk to them, and really
5123 understand what their concerns are, and then we can come back
5124 and give them the information that they would like, or we can
5125 talk about how we would get that information. And similarly,
5126 that theme of mutual learning also popped up in the Spotsylvania
5127 exemplar. Carmen, I don't know if you have any more specific
5128 examples of that.

5129

5130 MENDEZ: No, I think you're entirely correct, Angelica, and the
5131 other point is that we would expect to see a lot more on the
5132 listening from the community because that would be their primary

5133 concern, and as I said, that's one of the pieces that we're
5134 looking forward to.

5135

5136 LESLIE: Yeah, and I guess my point was that by not putting it
5137 into your slides you're making people have to go to the
5138 transcript or watch a three-hour meeting to hear the key lesson
5139 learned. So, it's like you haven't internalized, that's the
5140 lesson, and that's the lesson you want to share. Again, you're
5141 talking about your international things being internal
5142 documents. Think about the opportunities you have here to really
5143 say what are the key lessons and see that they are shared
5144 across. Anyway, it's just an observation.

5145

5146 SARA EVA: Listening is not unique to nuclear, right? Listening
5147 is important everywhere in every aspect of our lives, right-
5148 siting, working with your colleagues, or, you know,
5149 communicating with your family members, right? Nevertheless,
5150 listening I think has a specially, special weight, when we talk
5151 about siting of spent nuclear fuel management given all the
5152 previous history, and I think it applies to our international
5153 partners because we've heard the consistent theme that they
5154 started the process, and it didn't work. Then they came back,

5155 and they listened, right? So, I'm sure we'll see... we'll dig
5156 deeper and we'll see listening examples in, like, solar and
5157 wind, but, again, they enjoy a little bit more public support
5158 [chuckles] than we do.

5159

5160 LESLIE: Thank you.

5161

5162 SIU: I'll jump in, Steve, so you can rest your vocal cords.

5163

5164 [Laughter]

5165

5166 SIU: Following on Bret's comment about valuation of
5167 information, information sources, this morning we heard about at
5168 least some folks using or supporting neutral party analyses, and
5169 I was wondering if that's something that as part of the program
5170 might be considered part of the program.

5171

5172 SARA-EVA: I'll defer to Angelica and Carmen.

5173

5174 GHEEN: I'm trying to recall, I believe, when in the
5175 Spotsylvania site that they had advocacy, not just from
5176 specifically the pro-solar groups, but from groups that were

5177 originally not... that were not critical, but questioning, if you
5178 will, and invited them to the talks, but maybe I'm thinking of
5179 the BSL4. I apologize. In the preparation for my talking points
5180 they got a little jumbled in my mind. Carmen, can you help lead
5181 me? I'm astray [chuckles].

5182

5183 MENDEZ: [Chuckles] I think it was the Spotsylvania case, but I..
5184 I believe you are correct, but I can't guarantee it. I don't
5185 have that case fresh in my mind right now.

5186

5187 GHEEN: Okay, perfect. I feel more confident saying Spotsylvania
5188 now. Thank you [chuckles].

5189

5190 SIU: Chandrika?

5191

5192 MANEPALLY: Oh. Am I on? This is Chandrika Manepally, Board. I
5193 was just wondering if you have looked at the commercial
5194 consolidated interim storage facilities that Dan listed that
5195 none of them are operating, but were there still some lessons
5196 that you learned that maybe you could use down here?

5197

5198 SARAeva: The domestic ones that Dan mentioned?

5199

5200 MANEPALLY: Yeah, the commercial.

5201

5202 SARAEVA: All right. So, well, Dan talked a lot about the MRS,
5203 right?

5204

5205 MANEPALLY: Yeah.

5206

5207 SARAEVA: Of course, as we've heard today, we learned about the
5208 MRS facilities. We also looked at the successor, PFS, the
5209 Private Fuel Storage facility.

5210

5211 MANEPALLY: Yes.

5212

5213 SARAEVA: And, yeah, we are monitoring the private efforts that
5214 I think you are referring to.

5215

5216 MANEPALLY: Mm-hmm. And what have you learned just by monitoring
5217 so far? Have you learned some insights?

5218

5219 SARAEVA: There's a lot to learn, both on the technical side and
5220 on the social side, right? On the technical side, both sides...

5221 well, actually there's three sides, right, so there's a lot to
5222 learn for our technical team as it goes through the licensing
5223 process. As an aspect on the social side of things, we've been
5224 looking in the nexus of the dynamics between the local
5225 communities and the state, right? It's still unfolding, and,
5226 again, this goes to our thinking about the balance of engaging
5227 communities versus the state versus tribes unless tribes
5228 volunteer their affected communities, right? When is the right
5229 time and what should the balance be, because one of the examples
5230 on lessons learned from the MRS that I don't think we mentioned
5231 today was that they originally asked all the 50 governors... they
5232 sent letters to the 50 governors, right, and they received no's,
5233 so we definitely don't want to repeat that experience, right? We
5234 engage with representatives from states and tribal governments
5235 through different mechanisms right now, but, again, this is a
5236 community-driven approach, and we are considering this balance
5237 between community as part of the governments.

5238

5239 MANEPALLY: Thank you.

5240

5241 GHEEN: Also, I want to add that proposed work for next fiscal
5242 year—again, proposed—will be focusing on nuclear exemplars. This

5243 year we specifically were not looking at nuclear exemplars aside
5244 from the Negotiator, but next year we are going to do all
5245 nuclear industry, vaguely what broadly are nuclear.

5246

5247 BECKER: Steve Becker, NWTRB Board. So, I'm always very
5248 interested to know how when we've got really useful findings
5249 such as the kinds of findings that are coming from both the
5250 international and the domestic analyses that you are doing, I'm
5251 always interested to know how that will translate into practical
5252 actions going down the road. So obviously what you learn from
5253 this is going to influence the design of the process, and key
5254 findings will undoubtedly be integrated into the way you do
5255 business, so to speak.

5256

5257 I'm wondering, have you given any thought to how you might
5258 translate key findings from this work into how you train people?
5259 There will be obviously people brought on staff as the program
5260 matures and expands, but have you given any thought as to how
5261 you will utilize these key findings into training those new
5262 people?

5263

5264 SARAEVA: So, we definitely consider the training materials for...
5265 additional training materials, systemized training materials,
5266 for new staff. You know, this big effort requires a large team,
5267 right? Right now on my consent-based siting team I have five
5268 federal members. We also enjoy help from the cross-cutting team
5269 which is part of integrated waste management. We have support
5270 from Office of Communication Engagement in the front office, and
5271 we work with a lot of other offices, right, like General Counsel
5272 and many others. The teams at the national labs and the
5273 contractors grew a lot. We added a lot of new personnel, not
5274 only technical, but also social scientists, communicators,
5275 engagement experts, and many others.

5276

5277 So, you're absolutely right. As the team continues to grow it's
5278 like, how do you condense this knowledge and pass them in a fast
5279 fashion, right? Also... you know, life is life, and some people
5280 decide to leave the program and retire, right? So, yes, we do
5281 have plans for... first of all, we have, like, internal webinars
5282 that have been recorded and the general staff members have
5283 access. We also developed some materials and the access to
5284 different materials to be linked because, yeah, if I just
5285 started my work today and you land a thousand pages on my desk,

5286 I'll be overwhelmed, right? [Chuckles] We have a talented team
5287 of knowledge management experts who are helping us to systemize
5288 the approach.

5289

5290 BECKER: Thank you.

5291

5292 GHEEN: Yes, and I will add to that that Carmen's colleague,
5293 Lauren Drakopoulos—I wanted to make sure I pronounce that
5294 correct—did participate in one of these webinars that we
5295 recorded, so this work is actively being captured [chuckles].

5296

5297 BECKER: Thank you.

5298

5299 SIU: Okay. Do we have any other questions? Again, thank you
5300 very much, Natalia and Angelica and Carmen. Appreciate that. At
5301 this time we're a little bit early, just a few minutes early,
5302 but we can just take a longer break so we can start on schedule
5303 at 2:55, and then Marissa will address us on environmental
5304 justice.

5305

5306 [Break]

5307

5308 SIU: Okay, if we could get rolling again. Okay, so our next
5309 speaker is Marissa Bell, DOE-NE, talking about environmental
5310 justice.

5311

5312 BELL: Perfect. Thank you very much, and we're good on sound and
5313 everything? Okay, perfect. Well, so, thank you so very much for
5314 the opportunity to discuss the environmental justice framework
5315 and how we're sort of using best practices and lessons learned
5316 from environment justice and some of the ways it mirrors into
5317 our consent-based siting process. I think continuing a
5318 conversation that we were just having, I think it's very
5319 fortunate to have been able to study a process and become an
5320 environmental justice scholar, but also that this is valued
5321 across the board, and so to see that sort of being integrated
5322 and implemented is on a personal level extremely exciting.

5323

5324 So, speaking of extremely exciting and having sort of... there are
5325 different ways that environmental justice expertise is being
5326 sort of integrated I think both at DOE, but also at our national
5327 labs. I think a lot of the work that we just heard from we'll
5328 have incorporated some of that. So essentially what we're doing
5329 is taking that expertise, and it's not just myself, but also

5330 other folks on the DOE team that sort of take an interest in
5331 understanding diversity of perspectives and how we'll get
5332 integrated into procedural justice for example, which I'll get
5333 to in a second. But essentially, sort of, you know, together our
5334 work is focusing on deepening community engagement, having a
5335 collaborative process to understand and address what is
5336 essentially a sociotechnical challenge, and environmental
5337 justice is integral to that.

5338

5339 So, what do I mean when I say environmental justice? I think
5340 there are various... many ways to define it, and given the
5341 proliferation of this term and the different ways that it is
5342 used in public and academic and government discourse, I want to
5343 get us all on the same page about what we mean by environmental
5344 justice and how we're then integrating that into the process.
5345 So, what I have up here is a definition that is... it's slightly
5346 modified, and I'll explain the modification, but it's taken from
5347 the Environmental Protection Agency who have sort of over 30
5348 years of really taking environmental justice concepts and
5349 developing them.

5350

5351 But so this definition is "the fair treatment and meaningful
5352 involvement of all people, regardless of race, color, national
5353 origin, or income, Tribal Affiliation, or disability..." And so,
5354 the Tribal affiliation or disability, there was a recent
5355 Executive Order for environmental justice that just came out in
5356 April, and they added this Tribal affiliation and disability.
5357 So, this is a slightly updated version of the EPA one. So, the
5358 fair treatment and meaningful involvement of all people "with
5359 respect to the development, implementation, and enforcement of
5360 environmental laws, regulations, and policies."

5361

5362 So, you can already see that there are these concepts that you
5363 can sort of pull out of this definition and extrapolate, so
5364 distributive justice is tied to this notion of fair treatment,
5365 and it refers to the equal or unequal distribution of benefits
5366 and drawbacks of project sort of... the benefits that may come
5367 from it, but also some of the risks that may be born and how
5368 that relates to the project among various stakeholder groups or
5369 communities. Procedural justice is tied to the notion of
5370 meaningful involvement, and this addresses the equitable access
5371 of stakeholders and entities to processes of decision making.
5372 And so we had discussion earlier about, you know, where is the

5373 discussion of sort of listening and listening as a lesson
5374 learned, and it seems like listening is something that is
5375 foundational to various aspects of environmental justice and
5376 social science and our process at large, so sometimes it's
5377 helpful to understand that we need to vocalize that listening is
5378 important, and I think procedural justice is a place where
5379 listening is really key because it's not just about having
5380 people sort of participating by, you know, sitting in a room or
5381 at the end of a webinar listening to, you know, us blabber on
5382 [chuckles], but actually making sure that there is meaningful
5383 involvement and... I mean, I just want to emphasize that that is
5384 meaningful, and that means listening and really taking stock of
5385 what is being said by communities. So, it's just to kind of pick
5386 up and continue some of these conversations that we've been
5387 having in this room.

5388

5389 And then finally recognition justice refers to the recognition
5390 of all people and also recognizes the perspectives and histories
5391 and marginalization and oppression that some people may not have
5392 been meaningfully involved while others may have been, and so
5393 understanding this kind of situational context. Now, in the EPA
5394 environmental justice definition intergenerational justice is

5395 not called out, but given that the topic at hand of spent
5396 nuclear fuel we are talking about multiple generations, and
5397 we're also talking about historical effects of the nuclear fuel
5398 cycle. It goes without saying, but we should say it, that
5399 intergenerational justice is incredibly important for consent-
5400 based siting, and so that's not just delving into what has
5401 happened in the past, but also the wellbeing of future
5402 generations. And so, in the rest of the presentation we will be
5403 sort of delving into how we are operationalizing each of these
5404 aspects.

5405

5406 So, one of the ways that we look at sort of environmental
5407 justice in terms of best practices is to look at these things
5408 like the recent executive orders and also executive orders going
5409 back to, you know, the '90s and prior that have taken
5410 environmental justice and sort of integrated it. But this recent
5411 one, Revitalizing our Nation's Commitment to Environmental
5412 Justice for All, it basically codifies and makes real the notion
5413 of supporting inter-agency collaboration on programs and
5414 activities related to environmental justice, including
5415 development of materials, making sure that it's not just a
5416 resident environmental justice lead or expert that has knowledge

5417 of this, but that it's kind of integrated across the teams and
5418 from the lower level to the, you know, coming from the inter-
5419 council environmental justice council.

5420

5421 So, this also means building the capacity of federal employees
5422 to advance environmental justice, and, again, reemphasizing the
5423 ways that we can increase meaningful participation of
5424 individuals from communities with environmental justice concerns
5425 into federal activities of which consent-based siting is
5426 obviously one. Now, when we take... so there have been sort of
5427 various ways of lessons learned or sort of different principles,
5428 and I think when we look across the different executive orders
5429 or the different, like, best practices—EPA has sort of come out
5430 with these—we can see that there is some sort of underlying
5431 themes and very much those that have sort of come up throughout
5432 these conversations today.

5433

5434 Transparency, sort of transparency in our process, but also I
5435 really appreciate the call from sort of international partners
5436 to make sure that we take stock of also the... perhaps they
5437 weren't called failures, but sort of... [chuckles] somebody called
5438 them sort of "false starts," and I think that was a kind way of

5439 saying it sort of, but it's okay also to say that there have
5440 been failures across, you know, international context that we
5441 can learn from and that we ought to recognize and sort of be
5442 transparent because that's one way of building trust. Equity is
5443 another consideration, and this is different from equality. Some
5444 communities need additional resources in order to bring them up
5445 to speed. Access to resources is to ensure that folks are able
5446 to participate in conversations. Meaningful participation, given
5447 provision of access to information, these are all obviously very
5448 interconnected, but making sure that we can then have sort of
5449 informed community partners that are able to participate and
5450 that we listen to them and engage with them in a way that
5451 influences the process and decision making. And finally, all of
5452 these lead to, or to a part of the equation, for building trust
5453 and engagement and building relationships, which is key.

5454

5455 So, in terms of distributive justice, so while we're not seeking
5456 communities at present, I think there are different ways that we
5457 can in the future... we'll sort of look at what benefits or harms,
5458 you know, ways to avoid those. But at present... so, again, going
5459 back to these Executive Orders, so Justice 40 is ensuring that
5460 40% of the benefits and resources provided are going to

5461 communities that are historically disadvantaged or historically
5462 marginalized, so that's one way is making sure that we're
5463 compliant, and so we have within our team in consent-based
5464 siting an integrated waste management, but also then also the
5465 Office of Nuclear Energy has environmental justice experts that
5466 are sort of helping us figure out how we might do that best.

5467

5468 And then outside of the Office of Nuclear Energy we're sort of
5469 engaging in intra-agency collaboration. The Office of Economic
5470 Impact and Diversity has a strong focus on environmental justice
5471 and energy justice, and so working with those partners to
5472 understand how we might improve our processes. And then also
5473 there's inter-agency collaboration. So, I mentioned that we use
5474 the EPA's definition and that one example of a partner where
5475 we've worked with them to figure out some lessons learned from
5476 their process and have them take a look at our documents and
5477 different, you know, Requests for Information and different
5478 processes to understand how they may... you know, how we could
5479 take some of their sort of feedback and integrate and improve
5480 our process and making sure we sort of integrate that from
5481 various different angles and really leverage resources across
5482 sort of federal sectors.

5483

5484 So, in... so some further ways that we're leveraging efforts
5485 across federal sectors, so I mentioned before the White House
5486 Council on Environmental Quality, Climate, and Economic Justice
5487 Screening Tool. This is a tool that enables us to sort of
5488 identify what communities may have additional environmental
5489 justice concerns based on sort of existing contextual factors.
5490 There are other tools like the Environmental Protection Agency
5491 EJScreen—the EPA EJScreen—or the DOE Low-Income Energy
5492 Affordability Data Tool, and so essentially a lot of these tools
5493 will help us sort of identify what are some of these in terms of
5494 recognition justice and making sure that, you know, regardless
5495 of sort of context, that all are integrated into our process to
5496 ensure that we can do that in an equitable way and data-driven
5497 way.

5498

5499 The Bipartisan Infrastructure Law provision is an allowance for
5500 rural and remote communities which will so identify as
5501 communities that may lack resources, and the Nuclear Regulatory
5502 Commission as well has taken those Executives Orders that I
5503 mentioned previously and has developed some guidance for
5504 implementation. So, really kind of taking stock and, you know,

5505 sort of understanding what has been done and how we can leverage
5506 that.

5507

5508 So, as I mentioned, so right now we're not looking at... for any
5509 volunteers, but soon we may issue a call for volunteers, and so,
5510 at that point or later on there will be... increasingly we'll have
5511 to begin to have these discussions about the benefits and
5512 impacts that a consolidated interim storage facility would have
5513 on a community, and we're also looking at and preparing at the
5514 labs, preparing for discussions, about co-design and co-
5515 development. So, co-design would be taking a facility and what
5516 elements of the design of the facility could be influenced by
5517 the public, and co-development would be what are some of the
5518 additional resources or whether it's funding or sort of
5519 decoration of, you know, different facilities that would aid and
5520 sort of increase the wellbeing of that community. What are those
5521 different options? So, we're currently sort of evaluating in
5522 preparation for how we'll address distributive justice in the
5523 future.

5524

5525 So, procedural justice, I mentioned that... so this is sort of how
5526 we're engaging the public in various different ways, and one of

5527 these is a Request for Information which has been DOE's first
5528 step towards procedural justice in terms of getting feedback and
5529 input into our concept-based siting process. So, in December of
5530 2021 DOE issued this Request for Information. We received 225
5531 responses, and we heard about a variety of topics in the
5532 responses, and the analysis is available on our website.

5533

5534 And so there's various things we heard that DOE should develop
5535 an adaptive and flexible process, and clearly this is consistent
5536 with some of our international partners and the emphasis, so
5537 it's good to recognize the importance of that and the importance
5538 of engaging with tribes, states, and local communities at all
5539 levels and encouraging an involvement of those stakeholders and
5540 states and tribes into the process and into decision making, and
5541 finally also removing barriers to participation, which I'll
5542 speak to in a little bit more depth. And then finally, we also
5543 heard that we should provide resources, so that's consistent
5544 with EJ best practices, but we also heard from the Request for
5545 Information that we should provide resources. DOE listened, and
5546 we'll hear more about the consortia efforts, but in September of
5547 last year DOE responded by issuing a \$26 million dollar Funding
5548 Opportunity Announcement to support the planning phase and

5549 capacity building in order to address some of these
5550 environmental justice concerns and to sort of push our process
5551 forward.
5552
5553 So, the goal of the Funding Opportunity Announcement, so
5554 together these will create sort of the consortia, and
5555 essentially the idea is that the sum of the whole is greater
5556 than the parts, and so creating a kind of community of practice.
5557 And the various expectations will be that... sort of building
5558 capacity, and so part of that is creating resources, mapping
5559 public values, interests, and goals, and so part of that is
5560 getting to that procedural justice piece of like, what do we
5561 need in order to effectively engage and to understand sort of
5562 various perspectives of the public? Up in the top-right,
5563 innovate stakeholder engagements, so what are the different ways
5564 that we may... we know that, you know, not just nationally, but...
5565 countries are unique, but also very much communities are unique,
5566 and each community may have different needs. So that's the sort
5567 of the start of the process to innovate stakeholder engagement
5568 for the purpose of strengthening engagement.
5569

5570 And so... and at the bottom, reporting outcomes and strategies,
5571 that's because we want this to be an iterative process that is
5572 adaptive. So essentially strengthening engagement, building
5573 relationships and trust, particularly with underserved
5574 communities, engaging in mutual learning between the consortia,
5575 between DOE and the consortia, between DOE and the public, and
5576 sort of from all angles and developing capacity for decision
5577 making at a community scale, but also hopefully beyond that. And
5578 also understanding and defining consent, and we'll hear more
5579 about this when we discuss the consortia tomorrow.

5580

5581 So, I mentioned earlier sort of barriers to access. Limited
5582 internet access is a barrier to many, and we have an excellent
5583 team at the labs that is looking to... that has been looking at
5584 different factors that influence internet access for
5585 communities, so that may just be a lack of internet
5586 infrastructure and availability living in a rural area. I live
5587 in the Buffalo/Rochester area, right in between, in an extremely
5588 rural area, and [chuckles] frequently I'm grateful I'm here in
5589 person because I'd probably have internet issues. There is
5590 unreliability particularly in rural areas, but there are other
5591 issues that can also stand in the way in terms of affordability

5592 of internet and digital literacy. You know, some folks have
5593 difficulty navigating whether it's on mobile or on... there are
5594 different sort of barriers for different sort of demographics.
5595

5596 So, what the team has done is... has worked with sort of... looked
5597 at... spoken with community organizations that have a focus, or
5598 other federal agencies that have a focus, on limited internet
5599 access, and so I think, you know, we've had some sort of
5600 opportunities and some recommendations. This is very early work,
5601 but, like, expanding DOE event access or including audio dial-in
5602 where someone doesn't have to log in to view the Teams or the
5603 Zoom meeting, but can sort of just listen in via phone, SMS
5604 communications for those who... sort of, you know, that's another
5605 way to reach people. Designing content for mobile devices, so
5606 this does rely on internet, but there are ways to optimize our
5607 sort of communications so that when folks can't, you know, get
5608 access to a computer or there's not infrastructure available for
5609 that that we can reach them through other mechanisms.

5610

5611 And then developing alternative engagement strategies, we've
5612 heard about the importance of face-to-face, so that's certainly
5613 sort of a key piece of this, and also, partnering with local

5614 organizations and institutions. So, we're sort of obviously
5615 already doing this with consortia, but I think that there are
5616 different ways that we can sort of leverage different
5617 partnerships to be able to reach people in different ways.

5618

5619 So, in terms of environmental justice and our digital tools, so,
5620 we have a variety of resources that some have already been
5621 mentioned, but we have CURIE which is our resource management
5622 database that will be available to the consortia and in I think
5623 a limited capacity to the public as well, so things like
5624 improving user experience and taxonomies to better tag and make
5625 things accessible. Some, you know, like... you know, some search
5626 engines and databases are much easier to navigate, so we want to
5627 make sure that ours is easiest to navigate, and so, that serves
5628 as reducing a barrier to participation which goes towards
5629 procedural justice.

5630

5631 The other work, we have a working group to look at the various
5632 geographic information systems, so earlier we heard about one of
5633 these in Switzerland, and so we have a couple under development
5634 right now, the Land-Area Identification Tagging and Exploration—
5635 quite a mouthful, but [chuckles] easier to... we refer to it as

5636 LITE—and there's a Stakeholder Tool for Assessing Radioactive
5637 Transportation—the START Tool. And so, part of these... so the
5638 LITE Tool would be accessible to the public that they can be
5639 able to sort of identify what are some of the factors that may
5640 influence whether they would like a consolidated interim storage
5641 facility in their community. The START is obviously
5642 transportation focused, but I think as we sort of start to see
5643 communities more and more engaged, having an understanding and
5644 being able to provide them with an understanding of what are the
5645 factors that will influence transportation and how that will
5646 affect them, it would be incredibly important for understanding
5647 the impacts that we have or the impacts that a consolidated
5648 interim storage facility would have.

5649

5650 So in addition, sort of in line with the GIS work, there is a
5651 working group to identify data layers such as proximity to
5652 disadvantaged communities, so this is looking at various
5653 different sort of factors whether it's... you know, you can map
5654 out income levels, you can map out sort of education levels, you
5655 can map out minorities, and sort of understanding the confluence
5656 of all of these and how we can best serve communities that are
5657 marginalized or disadvantaged in some way. And there are ongoing

5658 enhancements in LITE to allow users to perform proximity
5659 analysis for select geographical locations based on these
5660 various data layers, so they can look at their community and
5661 understand how it will affect, or how it may affect, them.

5662

5663 So, I mentioned that intergenerational justice is sort of
5664 integral to our process, and this, again, to reiterate, is
5665 looking at understanding and recognizing past injustices, and
5666 we've had questions before where... in terms of, yes, we're siting
5667 a consolidated interim storage facility for spent nuclear fuel,
5668 but we have to recognize that some of the communities that may
5669 be engaging or that may be impacted may have been impacted by
5670 other elements like uranium mill tailing. We also have to look
5671 at the fact that the spent nuclear fuel is sited across the
5672 country at communities that didn't consent to it in the
5673 beginning, so kind of understanding, like, where sort of various
5674 injustices and how we may recognize that there are things that
5675 we can improve and sort of build trust where maybe there was
5676 mistrust. We have communities that have sort of had past
5677 interactions with DOE.

5678

5679 And so, the focus of this is sort of really to think about ways
5680 that we can rebuild trust and sort of recognizing and being
5681 transparent and then think about developing plans to ensure
5682 wellbeing of future generations. So, it's making sure that the
5683 impacts that we have are sort of minimized and mitigated. Part
5684 of this... so one thing that was recommended in the Request for
5685 Information, in the comments that were in response to the
5686 Request for Information, was this idea of an intergenerational
5687 council, sort of in line with the Council of Knowledge Holders
5688 that was formerly the Council of Elders and Youth at the Nuclear
5689 Waste Management Organization in Canada, and so we're currently
5690 exploring ways that we could... obviously the Council of Knowledge
5691 Holders has a Tribal focus, but I think there is interest, and
5692 so we have Tribal engagement, and so this would be sort of
5693 looking at ways to understand future impacts by integrating sort
5694 of either youth into the process or sort of figuring out ways to
5695 address intergenerational justice in an effective way. So, we're
5696 currently just exploring that possibility.

5697

5698 So, on the subject of sort of Tribes and the... you know,
5699 obviously one of the unique things about, you know, the U.S. is
5700 that we do have Tribes that we'll be needing to engage with who

5701 are sovereign nations, and so one of the very first
5702 recommendations is to respect that Tribal sovereignty and to
5703 comply with the laws and federal trust responsibility, and DOE
5704 takes that incredibly seriously, and in addition to that sort of
5705 looking internationally—United Nations Declaration of Free Prior
5706 and Informed Consent—that we do abide by and understanding how
5707 that influences our sort of processes and how we go about
5708 engaging and that at times there will be the need for formal
5709 Tribal consultation. So that was one of the first
5710 recommendations, so the Tribes have responded to us through the
5711 Request for Information, but also through other working groups
5712 like the Nuclear Energy Tribal Working Group or through other
5713 requests for public comment in the past, and these were sort of
5714 collated.

5715

5716 So, one of the second sort of thematic recommendations was to
5717 obviously develop trust and relationships with Tribes, to
5718 evaluate the impacts both on and off reservations, and to
5719 incorporate indigenous knowledge into siting, and so I think,
5720 again, perhaps learning from our international siting... you know,
5721 international partners on how, you know, Canada has interwoven
5722 indigenous and Western scientific technical knowledge will be

5723 incredibly valuable here. There's providing resources for
5724 participation in process and emergency response, and there has
5725 been the recommendation to establish a new organization to
5726 manage nuclear waste. Wouldn't be the first time, and won't be
5727 the last, but it's certainly something that we are... you know, we
5728 are taking seriously. And there's a recommendation to increase
5729 accessibility of materials. And so... sorry, just before I go on,
5730 we have sort of addressed these in different ways, which may
5731 actually... I think maybe that will be the... yeah, so I'll come to
5732 how we're addressing those, I think, in two slides.

5733

5734 So, we also have sort of various experts and subject matter
5735 experts with Tribal background or with background engaging with
5736 Tribes and experience with them, so we've been kind of given
5737 some broader sort of recommendations for how we develop our
5738 Tribal engagement and consultation strategy. So that is
5739 currently in development, so these are very preliminary, but
5740 essentially understanding and respecting Tribal sovereignty more
5741 broadly, providing resources to Tribes for participation and
5742 decision making, and building capacity and internal resources
5743 for Tribal engagement. So, this sounds similar to the second
5744 one, but it's actually referring to within DOE. So, within DOE

5745 and our national labs building up that capacity in order to be
5746 able to effectively engage with Tribes.

5747

5748 We need to... you know, we have various trainings, but we need to
5749 expand those trainings. We need to understand the perspectives,
5750 understand things like, you know, that each Tribe may have its
5751 own political decision making or its own sort of cultural
5752 elements that are specific to that Tribe, and so a lot of
5753 resources will be needed on our side to build that capacity as
5754 well to prepare and to have effective Tribal engagement.

5755 Utilizing early and transparent community, that probably should
5756 say "engagement" [chuckles]. I'm not sure where the mysterious
5757 word is that's missing, but essentially just doing things very
5758 sort of early on and making sure that Tribes are aware and
5759 they're not sort of, you know, thrown a curveball at the last
5760 minute like, "Oh, we expect consultation." No, we need to start,
5761 and we've already kind of started to build those, but it does
5762 take time. It really does take time, and so one of the also ways
5763 is not just direct engagement, but also engaging with and
5764 through trusted programs. There are programs—the Office of
5765 Indian Energy at DOE, for example, or the EPA and sort of the
5766 Institute for Technology and Environmental... Institute for Tribal

5767 Environmental Professionals—but I think that the key here is
5768 that there are folks who are already doing brilliant work that
5769 we can partner with and engage with. Some of our awardees or
5770 consortia awardees also have some of these resources at hand,
5771 and so we're really excited about how that develops.

5772

5773 So, in terms of how DOE is integrating Tribal recommendations,
5774 so collaborations across DOE with other federal agencies to
5775 prepare for consultation and for implementation of federal
5776 guidance to comply with laws and partnering with trusted
5777 programs and institutions. I've already mentioned that we've
5778 been sort of starting that process and broadening accessibility
5779 and engagement. We heard directly that, you know, not all Tribes
5780 have the same access to digital resources, so sending out
5781 information about our Funding Opportunity Announcement through
5782 hard physical copies, that's just a very small thing, but it
5783 works a long way towards increasing accessibility and
5784 engagement. Building capacity and resources at DOE, as I said,
5785 to support Tribal engagement and providing funding and resources
5786 as we've started through the consortia, but also through future
5787 funding opportunities.

5788

5789 So, with that in mind, I just want to conclude by sort of, if
5790 you hadn't noticed, environmental justice is incredibly
5791 important to DOE, it's incredibly important to me, and I think
5792 that in terms of making consent-based siting, which I believe is
5793 fundamentally an environmental justice-informed process, it's
5794 really ensuring that that is constantly integrated into what is
5795 an adaptive and iterative process, so, with that I'll lead to
5796 questions. Thank you very much.

5797

5798 SIU: Thank you, Marissa. Okay. The floor is open to Steve, of
5799 course.

5800

5801 BECKER: Steve Becker, NWTRB Board. Thank you for a very nice
5802 presentation. So, my first question, EJ is obviously quite
5803 important, but how will you know whether you have succeeded in
5804 integrating and incorporating EJ into your process, into the
5805 consent-based siting process? Will it be some sort of metric
5806 involving numbers of participants? Numbers of organizations?
5807 Will you be doing survey work? How will you know whether you
5808 have achieved success?

5809

5810 BELL: That's a very interesting and... yeah, an interesting
5811 question because I think that it's very early to be thinking
5812 about ways to measure that success of the long-term goals, but I
5813 think that there are steps that we're doing now in terms of
5814 internally at DOE and then within the labs, so one example is
5815 looking at sort of metrics and analytics of the consortia
5816 engagements and sort of understanding how the consortia are
5817 implementing those sort of environmental justice principles, and
5818 so there are things that we can do on that end.

5819

5820 There's also sort of stakeholder and other types of engagement
5821 metrics that we're looking to develop in order to precisely
5822 assess, so I would say that we're working on that, but we don't
5823 have any concrete, like, right now, what are we doing to
5824 measure, but we're certainly... yeah, that will be a primary... that
5825 will be a huge focus, I think, for our FY24 is figuring out how
5826 we... and not just metrics of engagement, but, like, metrics of
5827 meaningful engagement. So, we don't want just we have 30 people
5828 in a room. We want to understand... and I thought it was really
5829 interesting earlier... and I can't remember if it was Saida or
5830 Piet mentioning the only interactions of over an hour. You know,
5831 like, that's something that it's very simple, but, you know,

5832 just having someone in a room, how do you count that engagement?

5833 But, I mean, it would obviously go much beyond that, but that

5834 could be... I think we can also look to our partners to also help

5835 us with that.

5836

5837 BECKER: Is there literature at this point that might be helpful

5838 in development some of those metrics?

5839

5840 BELL: Yes. I think [chuckles]... so I'm less familiar with the

5841 sort of quantitative literature on sort of, like, metrics and

5842 things like that, but I think in terms of what constitutes

5843 meaningful, there's a ton... at least from a social science

5844 perspective there's a ton of really valuable... you know, like

5845 Arnstein's Ladder of Participation, of, like... which is basically

5846 looking at... you know, you're just telling a public, and that's

5847 participation because they're in the room, but you're just

5848 talking at them to... all the way to, like, community empowerment

5849 and the different ways of engaging with publics, and so I think

5850 that... I mean, that's just one example, but, yeah, there's a

5851 wealth that we... we have some literature of these, and I think I

5852 mentioned some of those tomorrow in the discussion of social

5853 science integration, but there's a lot to draw from. Yeah, thank
5854 you.

5855

5856 BECKER: Thank you.

5857

5858 BELL: And I should also probably call out that Dr. Tran Le who
5859 will be with me in the presentation tomorrow for social science
5860 integration, but from the behavioral psychologist perspective,
5861 there's a broader literature even beyond just what I'm familiar
5862 with, so we're very grateful to have her expertise on the team
5863 in that regard, so, thank you.

5864

5865 TYLER: Thanks. Scott Tyler with the Board. Thank you, Marissa,
5866 for an excellent presentation. Maybe just echoing a little bit
5867 on Steve's just to begin with, it would seem like looking at
5868 the... and, again, suggestions, and not necessarily a question,
5869 but looking at the international program reviews that your group
5870 has been doing and seeing and kind of judging, how... what groups
5871 would be considered to have been treated environmentally unjust?
5872 I don't know the correct term for that, but, who's been tapped
5873 in those regards? And then comparing that to your consortia
5874 distribution that you already have the metrics, I think that

5875 would be really helpful. It might help guide maybe the next
5876 round of consortia funding to make sure that those individuals
5877 or those groups are represented as well as other groups from
5878 state and local and things like that in that group.

5879

5880 And then, this is out of my area of expertise, so I'm just going
5881 to ask the question a bit, but with respect to intergenerational
5882 environmental justice, how do you think we will deal with the
5883 issues of perceived risk at places where we already... let's say
5884 we already have nuclear power plants or nuclear facilities where
5885 the perception of risk is different than it would be in a
5886 community that has none of those, so typically there might be
5887 more acceptance to that risk, and yet, those... to me, it tends to
5888 continue intergenerational environmental justice issues because
5889 you're carrying that... you already have this facility, and now
5890 you're going to have another one, and then those kids are going
5891 to have to deal with that. Do you have a sense of how we will
5892 address that or how you will address that?

5893

5894 BELL: That's also a very interesting question, and I'm not
5895 sure... so there's one interesting point that I'm picking up on,
5896 and that is sort of like the understanding of cumulative impacts

5897 and that if a community has already been overburdened
5898 historically that perhaps, like... I mean, a facility could sort
5899 of work to remedy some sort of historical oppression, but there
5900 are ways that we may not even know that it could compound
5901 existing issues, and so I think one way to look at that... and
5902 that's where when we have communities volunteer to really sort
5903 of dive deep and sort of understand that community really well
5904 in terms of their future direction and their sort of wellbeing
5905 and how we could adapt the, you know, the facility to the extent
5906 that we can, given that some things are not changeable, but so I
5907 think that would be one way to sort of understand.

5908

5909 So, I get that that was probably part of your question, but not
5910 the main thrust, so the other part of your question would be
5911 sort of addressing sort of what I would call nuclear
5912 communities, and that's not DOE. That's social scientist
5913 Marissa. So, is the question about sort of how a nuclear
5914 community would perpetuate and continue in terms of low-risk
5915 perception? I mean, that in itself I think is quite an
5916 interesting question. I would say that like I mentioned earlier,
5917 so previous research sort of looking at... I mean, we do know that
5918 sort of around nuclear power plants there tends to be more

5919 acceptance and understanding and knowledge and familiarity and
5920 the economic benefits and things, so we are doing sort of more
5921 work. I mentioned before current host communities, but looking
5922 at, like, what are some of the perspectives of those who are
5923 already hosting nuclear facilities in some way and then how that
5924 will influence sort of potential information provision or
5925 potential concerns or potential ways that benefits and impacts
5926 may need to be negotiated. But I'm not sure if I directly
5927 answered your question [chuckles]. If I didn't, please feel free
5928 to reframe.

5929

5930 TYLER: No, I think it's a very difficult question because it
5931 really gets to how one would then perceive intergenerational
5932 injustices in this case. Again, if a community used the risk as
5933 more acceptable, for example, they are much more likely I would
5934 assume to try to host or volunteer to host a facility, and from
5935 the outside that might look intergenerationally unjust, but to
5936 that community it isn't. So, again, I don't... there's no... I don't
5937 have an answer to this. It's not my area, but it's a tough one.

5938

5939 BELL: Yeah. No, it is a challenge, and what I would add I
5940 think, at least... and, again, this is social scientist speaking

5941 here, not for DOE, but in terms of the going back to the NWMO
5942 process in Canada, you know, that Bruce nuclear facility—Bruce
5943 Nuclear Power Generation Plant—was sited there without... you
5944 know, and it's very openly acknowledged that it was without the
5945 Saugeen Ojibway Nation's involvement, and so now that sort of
5946 effort, the NWMO's effort, of that sort of reconciliation and
5947 taking that very seriously and partnering with the Saugeen
5948 Ojibway Nation to try and sort of counter that, I think that
5949 it's possible that a facility that was... you could say it was,
5950 you know, potentially not sited with environmental justice in
5951 mind.

5952

5953 It was a different era. I mean, we're talking, like, '50s or
5954 1960s. I don't know how many years ago [chuckles], but so I
5955 think, thinking about how you can use current practices to
5956 restore and address previous harm, that's one way, but in terms
5957 of future, yeah, that... I mean, again, social scientist me, I
5958 think where there is a dominant nuclear acceptance in a
5959 community it can sometimes stifle voices of concern. So, there's
5960 a paper floating around about that. I'll just leave it at that
5961 [chuckles]. Social scientist Marissa, and not DOE Marissa, so,

5962 but thank you for that thought-provoking question. I appreciate
5963 it.

5964

5965 BALLINGER: Ron Ballinger from the Board. There are quite a few
5966 sites around, and one I live very close to actually where the
5967 initial so-called process of getting it licensed and built was,
5968 to say the very least, contentious. But now, if you go to that
5969 area you will discover that people really like the site. They're
5970 very enthusiastic about it, and some of those people were young
5971 people when they tried to build the site there, and now they're
5972 a little bit older, actually, a lot older, and so it may be
5973 productive to think about talking to those people. Because in
5974 this case there were several misperceptions, and that usually is
5975 the case when there's an adversarial process going on. But then
5976 those problems, so-called problems, either resolved themselves
5977 or didn't exist to start with, and now the people's, the same
5978 people's, opinion has evolved as well. So, it might be
5979 productive to ask these people, you know, "Okay, you were 20
5980 years old, and you hated the place, and now you're 60 years old,
5981 and you got a job. What changed your mind?"

5982

5983 BELL: I love that suggestion, and I actually want to make a
5984 callout to one of our interns, our environmental justice
5985 interns, that was in first year of undergraduate, 18 years old,
5986 Mahi Bath. She did a research project and started to look at
5987 organizations or prominent individuals that changed their mind
5988 and what were the strategies, and so she's kicked us off on a
5989 [chuckles] particular trajectory where we could potentially sort
5990 of actualize this and sort of create... because it is interesting,
5991 and I think that... you know, particularly current generations who
5992 haven't necessarily lived through, you know, Cold War and sort
5993 of nuclear weapons, coupling of nuclear weapons and nuclear
5994 energy... that now current generations, like, all we know about is
5995 wildfires and increased hurricanes and, you know, hurricanes in
5996 California.

5997

5998 I mean, literally you could... you know, so climate change is so
5999 on the mind that there are different... you know, so I think there
6000 are different reasons, and I think that... so I love that idea of
6001 looking at also, like... I mean, not just intergenerational
6002 change, but change over time of what... because risk perception,
6003 there are various factors, and it may be that, you know, being
6004 able to have a voice in procedural justice and having some

6005 control over the process can change... I mean, there's research to
6006 show that that will change people's perception, so maybe we can
6007 take this offline and I can get some information.

6008

6009 BALLINGER: You might think about reading a little book called..
6010 by Harold Lewis which is called *Technological Risk*. You can read
6011 it in an evening.

6012

6013 BELL: I'll definitely...

6014

6015 BALLINGER: Sometimes the easier read ones, the easier-to-read
6016 ones are the most easy to understand.

6017

6018 BELL: Suggestion well taken. Thank you very much.

6019

6020 SIU: Steve, did you want... had a question, a quick one?

6021

6022 BECKER: Sure. Steve Becker, Board. I appreciated my colleague
6023 Ron's idea of including the perspectives of those who are mature
6024 citizens. I'm going to... we're all mature citizens here, right?
6025 I'm going to go to the other end of the spectrum. I was actually
6026 intrigued in your discussion of intergenerational justice by

6027 your mention of the idea of including the perspectives of young
6028 people, and you mentioned that it's something that you were
6029 looking into. Are you aware, or do you know of any other sorts
6030 of efforts, whether in the field of philosophy or in the field
6031 of EJ or other fields, to translate that into practical steps
6032 such as a youth advisory board? Have there been such
6033 initiatives, and did they turn out to be useful?

6034

6035 BELL: Yeah, so the current report that is in development.. and
6036 so I only just recently, I think as of a couple of weeks ago,
6037 got a briefing on where they are, but one of their activities—
6038 and this is all social scientists at the labs—is sort of
6039 collating various types of intergenerational justice councils,
6040 and also some of them are youth advisory boards, so specifically
6041 looking at youth and youth perspectives, so, yeah, they're
6042 looking at the practicalities of, how do you recruit people? Are
6043 you focusing on high school students, like what ages are kind of
6044 optimal? Like, there's tons of, yeah, really valuable examples
6045 that we're looking at to basically draw from, well, how could we
6046 really operationalize this?

6047

6048 I'll also add that there are other perspectives out there like
6049 in my research in Canada I had community members say, well, you
6050 know, like, women may sort of be more inclined to have, you
6051 know, sort of... you know, they may have ways of thinking about
6052 the future, so including... and in South Bruce I will say that I...
6053 you know, I approached women to interview them, and they would
6054 say, "Oh, no, no. Chat with my husband." Like, "He's the one who
6055 knows," and I'm like, "No, I want your perspectives." Like,
6056 "Please, if you'd be..." and they're like, "Oh, okay." So I think
6057 that... I mean, not to go too far down this route, but I think
6058 that, you know, there's been incredible progress in the nuclear
6059 sector broadly on sort of inclusion of women. I mean, you know,
6060 like, [chuckles] it's fantastic. But, you know, like, I think
6061 that engaging, that could be one mechanism, but, so from a
6062 philosophical perspective I thought that was an interesting
6063 point of, yeah, a community respondent gave me, so thank you.

6064

6065 BECKER: Thank you.

6066

6067 SIU: Alrighty. Thank you very much, Marissa. That was terrific,
6068 and now we'll have the closing facilitated panel discussion led
6069 by Bret Leslie.

6070

6071 BELL: Thank you.

6072

6073 LESLIE: As our panelists make themselves up to the front and
6074 settle in, let me just kind of go over how I envision this
6075 closing facilitated panel discussion to occur. I've talked to
6076 all of you, but just for our audiences' perspective, what I'm
6077 going to do is first ask the Board's invited speakers—Dan,
6078 Saida, Piet—to kind of point out something that you heard from
6079 our DOE presenters first that you either want to emphasize or
6080 ask a follow-up question or think is important, and after you've
6081 all had one chance to do whatever you've heard then... and it
6082 could be something that the Board asked DOE that you want to
6083 amplify. Then I want to turn to Natalia, Juan, and Marissa, and
6084 I did see an online comment that we haven't been doing a very
6085 good job of introducing folks, so Juan Uribe is the Department
6086 of Energy, Office of Nuclear Energy, and he's joining us with
6087 DOE on the panel this afternoon. Appreciate him coming.

6088

6089 And then after you all—Marissa, Juan, and Natalia—have had a
6090 chance to go on, then I'll just... I'll use the, you know, turn
6091 your nametags up to kind of get the flow to go. I also probably

6092 will turn with about 30 minutes left. Nathan, can you remind me
6093 if I lose track of time?... to turn to the Board to ask some
6094 questions. So I hope that's clear. Any questions on process? If
6095 not, I'm actually going to start with Dan this time and then go
6096 straight down the table. Thank you, Dan.

6097

6098 BULLEN: Thank you, Dr. Leslie. Actually, I have a couple of
6099 questions that are follow-ons to the DOE presentations, the
6100 first of which actually is a question to Dr. Bell with respect
6101 to intergenerational equity, and also then with respect to the
6102 studies that you're doing for the benefits that are brought in,
6103 have you looked at the inverse? Have you looked at a closing of
6104 a nuclear power plant and the impact that that has on the
6105 community? And you have to keep in mind that a nuclear power
6106 plant pays a tremendous amount of property tax, and that
6107 property tax improves schools, hospitals, roadways, fire
6108 departments, police forces, and when that goes away it's a
6109 tremendous impact to that community. Can you use any of that
6110 information in conveying to the communities that you would like
6111 to volunteer that these benefits are real and tangible? I just
6112 wondered if you could give us a little bit of a background on
6113 that.

6114

6115 SARAEVA: I can actually start. I'm not Marissa, I'm Natalia,
6116 but then I'll let Marissa join in. So, there's definitely the
6117 benefits that goes with a nuclear power plant, right, and the
6118 benefit that will go with a federal interim consolidated...
6119 federal interim consolidated storage. Sorry, it's been a long
6120 day. Exciting, but long. So, they're both just slightly
6121 different because the storage itself, once constructed, right,
6122 it doesn't create that many jobs that nuclear power plants have,
6123 right? So, it's comparatively slightly different facilities,
6124 right? However, the benefit that goes with a facility will be
6125 negotiated with the community, and there, of course, it will be
6126 subject to the appropriate funding that we will have, but they
6127 might include the complicated facilities, right, and the
6128 communities will decide what they are.

6129

6130 So, of course, there is definitely a benefit at looking at that,
6131 and Marissa can provide more from the social science perspective
6132 on comparing those. I'd also like to mention that at some of the
6133 sites that seized operations, some of the communities really do
6134 feel the impact in not having those benefits, but at the same
6135 time, some of the communities, like Zion, for example, they

6136 would like to reuse that land because they own the Lake
6137 Michigan, right, and they can create some other facilities,
6138 right, and reuse that and not necessarily hosting... storage. So,
6139 I'll hand it over to Marissa now.

6140

6141 BELL: Yeah, thank you, Natalia. Those are really valuable
6142 points, I think, to bring up. I don't have too much to add, but
6143 what I could add is, I mean, just to kind of reemphasize that
6144 point about thinking about both the short-term impacts of a
6145 consolidated interim storage facility and also the long-term
6146 impacts in ensuring that the community is better off with the
6147 facility and thinking about sort of, you know, generationally as
6148 well, I also... I think what would be interesting and something
6149 that's sort of within the social science literature at large is
6150 the sort of clean energy transitions literature and looking at,
6151 you know, for example, coal communities that are sort of closing
6152 down, and there's sort of the need for new opportunities, and so
6153 I think that... and I believe some of the consortia may have at
6154 least sort of Julia Haggerty's work as one of the partners, and
6155 so she's out of Montana, so it's really being able to understand
6156 how we might play a role in the clean energy development, and
6157 not just from the perspective of Office of Nuclear Energy and

6158 nuclear energy development, but also sort of sustainability as a
6159 broader economic sustainability, environmental sustainability,
6160 and social sustainability. So those will be important things to
6161 think about. Thank you.

6162

6163 BULLEN: Just one quick follow up, Bret, and then I'll let it
6164 go, but, Natalia, you brought up a very good point, which was
6165 actually something that we had discussed when we tried to do the
6166 Iowa project, and that was that you need to bring industry in.
6167 One of the industries that's an obvious choice would be, why
6168 don't you just fabricate the casks there? So that's a huge
6169 infrastructural improvement, but if it's going to be the site
6170 where the interim storage facility is, then why don't they build
6171 them there, go fill them up at the reactors, and bring them
6172 back? Has that been considered by DOE?

6173

6174 SARA-EVA: We're right now not considering the particular... we
6175 don't develop the... you know, at least we'll go with the
6176 communities there, but of course we're thinking about different
6177 options, and one of them might be a quantitative research
6178 facility, a fabrication facility, or maybe some communities will
6179 be interested in collocating with an energy production source,

6180 maybe an SMR, or maybe a solar wind farm, right? Some
6181 communities might want something different. They might want
6182 something new and use coal. So right now we also want to hear
6183 more from communities on what they want, and that will be
6184 determined during the process.

6185

6186 LESLIE: Thank you, Natalia. Thank you, Dan. Saida?

6187

6188 ENGSTROM: Thank you very much for your presentations. They were
6189 very interesting. I have a set of actually scattered comments
6190 that I'll deliver just like that, and we'll see what we can do
6191 with those, but if I was in your shoes, and I'm happy I'm not
6192 because I've done all this work once before, so, but, if I were
6193 in your shoes, I would start actually with making an autopsy for
6194 the failures for your own benefit and also being very open about
6195 that. When you start a constant paced process opening about what
6196 you think, what you assess you did not so good in the past, that
6197 would be a trust winner. That would give you trust with people.
6198 You can look back and see what you've done that's not up to your
6199 standards of today and how you would like to change that. I see
6200 you are doing lots of investigations to nurture your process,
6201 but I still wonder, who's sitting in the driving seat?

6202

6203 Continuity is key. All these communities want to know who's in
6204 charge, and it's not a corporation, and it's not an
6205 organization. People trust people, so if you want actually to
6206 reach people in depth you have to have a set of individuals that
6207 everybody knows in these communities because they keep coming—
6208 the same faces—and also they want continuity from the upper
6209 management. I know you have the challenges of the two years' new
6210 appointees, political appointees every four years, and that's
6211 very, very hard. You... I don't know how you can drive a program
6212 under those conditions. It's really challenging. I feel for you
6213 in that respect. You cannot have that continuity, but at least
6214 the people that will shoulder these dialogues with the
6215 communities, they have to be the same. They have to be people
6216 that everybody knows and also trustworthy people that you have
6217 to have a profile for. It's not a job for everybody. It really
6218 requires special personalities and some social skills.

6219

6220 And my last comment, and I have many more, but at least for now,
6221 is I would have loved to see a mapping of the communities you
6222 would like to meet with based on assessing lots of requirements
6223 or factors. Where are these factors or requirements? You should

6224 be having those and mapping the communities that you will start
6225 your dialogue with and start to have key messages really simple
6226 and the... I'd like very much... I work... As I said, I ran a research
6227 program for ten years, so social science, I'm not an expert in
6228 those, but I had several professors running it for me. But I
6229 think you maybe have to think also not to overcomplicate the
6230 process. I know by experience that when I had some of the social
6231 scientist meetings with the communities it did not go very well,
6232 not because what they were saying was not right, but because
6233 they were using academic language that people did not understand
6234 at all. So that was not really helping. That was not simplifying
6235 our work. So, these kinds of things, you can do that work, but
6236 you do not deliver it that way outside the... your organization.
6237 But I'm still thinking about continuity and if you have a
6238 comment on that and also this what I call autopsy of failures...
6239 or shortcomings, as you said.

6240

6241 SARA EVA: Yeah. No, thank you so much. I'll start and let my
6242 colleagues to add. So, in terms of the list of failures, right,
6243 so we're not shy of recognizing that previous processes didn't
6244 work, but the listening has been mentioned here, right, a lot,
6245 and right now we're in the stage of listening, right? To us,

6246 listening starts was just maybe not say too much and have the
6247 opportunity to listen more so we can go back and reflect on it
6248 and then strategize how we can adapt our communications, right,
6249 about the program. But I do agree with you that the list of
6250 failures, as well as list of... or practices that worked well,
6251 they go a long way.

6252

6253 Second is on continuity. You said it right, right? We are the
6254 federal government, so we are in the cycles of political
6255 appointees, however, we do have career people working on this
6256 team, right, and we do have continuity in the way that we knew,
6257 right, but some of our members of the team was the DOE, the DOE
6258 contractors, in the labs, and they've been working on this issue
6259 for many, many years, right? So, we do have maybe not perfect
6260 continuity yet, but we do have it, and you do bring an important
6261 point of how we continue to build that, right? We just hired so
6262 many new and, you know, younger staff members that are working
6263 alongside with those more experienced staff members to allow the
6264 transfer of the knowledge and also, the continuity.

6265

6266 And on the community mapping, I'll talk more about our process
6267 tomorrow, but we are starting with... so we're not looking for

6268 volunteers, right? We're looking for the mutual learning which
6269 those who are involved in mutual learning through our consortia,
6270 they may or may not consider to be the volunteers in the next
6271 phase, and if some didn't participate in this mutual learning it
6272 doesn't mean they cannot be a volunteer and vice versa. And
6273 there are multiple reasons to that because first, it allows us
6274 to have a better map, so to speak, on, all right, what type of
6275 informational gaps, knowledge gaps, are out there, right,
6276 because, to your point, right, you go through different
6277 communities and you speak with different community members, and
6278 it comes as different knowledge and they come as different
6279 perspectives, right, so knowing that is really important to us.
6280 Granted, we only have 13 consortia members and several partners,
6281 and they've only been working with just some communities and not
6282 all, so we will not cover all the map, but we will at least will
6283 have a better understanding.

6284

6285 LESLIE: Thank you, Natalia.

6286

6287 SARAIEVA: Okay.

6288

6289 LESLIE: We're halfway through. I want to make sure you have a
6290 chance to ask them questions.

6291

6292 SARA EVA: Sure, and we can chat after.

6293

6294 LESLIE: So, Piet, if you could get yourself closer to the mic
6295 and ask your questions, and then that would be great.

6296

6297 ZUIDEMA: Yes. It's more of a comment and half a question. So,
6298 what you did do was presented really interesting studies, thank
6299 you, but I'm not sure, are they really applicable to your
6300 program at hand, and that means, how do you characterize your
6301 problem at hand? What are your real issues, and did these other
6302 things you looked at have the same issues? And, you know, if I
6303 say what are your issues, then... and I'm... you know, I don't know
6304 the U.S. program in detail at all, but what I understand you
6305 have current facts. You have the law, the Nuclear Waste Policy
6306 Act, and you have Congress, and then you have current trust and
6307 distrust, and then you have an overall nuclear program. That
6308 means you have power plants, you have storage, you have
6309 disposal, you have transportation. I have to feel you have a lot
6310 of things that are not directly compatible to, for example, your

6311 solar plants. It's completely different, so I'm not sure in how
6312 far all these lessons learned are really applicable to your
6313 case.

6314

6315 And the second thing, you know, you are in a hurry if I
6316 understand correctly. Probably I misread some documents, but you
6317 want to do things really, really fast, and in how far do these
6318 poor communities, how can they ever manage that, and what are
6319 you doing in that respect to help them to get up to speed to do
6320 this work in a very few years? That is for me incredibly
6321 difficult because these communities, they're very heterogeneous.
6322 Those that profit from this, the others that suffer from that,
6323 it's hetero. And then you want to make consent-based decision
6324 making, and you have even neighbors and a governor above, etc.,
6325 and I haven't seen that much about these issues. So, it's more...
6326 the overall question is, why did you choose what you have done
6327 now, and why did you not choose something else? But probably
6328 it's an unfair question, but [chuckles] anyway I ask it.

6329

6330 SARAEVA: Well, the problem is we're addressing at least parts
6331 of it. At least I'll touch upon the timeline. I think you're
6332 referring to the timelines that we listed in our process

6333 documents, right? There are two caveats to that. Caveat number
6334 one is we're talking about siting interim storage, right, not a
6335 disposal, so, granted, for disposal those timeframes would be
6336 much longer. Second caveat is those timeframes are just
6337 estimates, and we included the timeframes per popular feedback,
6338 right, to provide some estimates. Again, we acknowledge, and I
6339 think it's written in our process document that as we've heard
6340 loud and clear from public comments and from previous
6341 experiences this will... and I'll quote one of the public comments
6342 we received. The consent-based siting will go with the piece of
6343 establishing trust, right, and also the timeframes might be
6344 slightly different in different communities depending, again, on
6345 many, many factors, including the knowledge, the dynamics
6346 between the interested host and their adjacent jurisdictions,
6347 and I'll stop to see if Juan or Marissa has anything.

6348

6349 LESLIE: Actually, I'm going to move on and turn the tables and
6350 say it's time for you guys to ask the people across the table
6351 what you wanted to expand or learn a little bit more, and I'm
6352 going to actually start with Juan because he hasn't had a voice
6353 at the table yet tonight. So, Juan, go ahead.

6354

6355 [Laughter]

6356

6357 URIBE: Thank you, Bret. Again, my name is Juan Uribe. I'm a
6358 senior program manager with the Department of Energy in the
6359 Office of Integrated Risk Management, so I'll be speaking a
6360 little bit more tomorrow on the consortia activities, but I
6361 appreciate the opportunity to be here today. I guess I'll start
6362 with a question, and maybe you guys can decide who wants to
6363 start, but if you go back to the beginning of your respective
6364 processes or when you actually had identified communities that
6365 you were now able to work more directly and attend the specifics
6366 of that area, what would you say were the resources that you had
6367 at hand, that you had prepared, that you were very grateful you
6368 had them at hand because they were very useful in helping to
6369 engage and reach those communities?

6370

6371 And then the other side of that is, you know... and I know you
6372 mentioned you didn't want to go back in time, but if you could
6373 go back in time, what would be a resource or something that you
6374 later found out it was critical for success? Where I'm coming
6375 from is we have the consortia. We're trying to come up with

6376 resource that we think would be of use to them and also for the
6377 general public, so I just wanted to get your insights on that.

6378

6379 ENGSTROM: I can start, and then leave to Piet. What we did
6380 before... when we identify a community, for instance, we would
6381 like to start a dialogue with them. We would commission a
6382 consultant that's very skilled in the field of investigating
6383 what are... what is the history of this community? What kind of
6384 discussions, political ones, they had? What hardships did they
6385 have with different projects? What are the demographics of this
6386 community? Unemployment? All kind of issues. So typically you
6387 would get a report, so before... even things like who are the
6388 formal leaders and who are the informal leaders? It could be 40
6389 years. The teacher in high school was the informal leader in
6390 debates and all that.

6391

6392 You want to know all the things before stepping in, so that was
6393 one thing, and when we discussed with people in the community
6394 and we decided, okay, who will be doing the feasibility study,
6395 what happened actually is... the first that happened is that we
6396 opened an office, and we recruited typically two or three people
6397 luckily. And why luckily? Because you want people that know

6398 people. You don't take your staff from Stockholm to run
6399 operations in Östhammar. It would not work. So, these are the
6400 things that we did, and the project... and we have a project
6401 manager. Typically, it was in Stockholm. I was the project
6402 manager for three feasibility studies, and I was also the face
6403 of SKB in those municipalities. So, I met with journalists very
6404 often. I gave interviews. I talked to politicians. I talked to
6405 citizens. So, you have a face of SKB, it's people. It's a young
6406 woman... I remember one of the articles about me, and "She has
6407 children too." Of course I have children [chuckles]. So, this
6408 kind of... you become a person in the community, and I had that
6409 obviously, and that was very important. If I had to change
6410 anything, I wouldn't change a thing because that was very, very
6411 good for us.

6412

6413 LESLIE: Thank you, Saida. Piet?

6414

6415 ZUIDEMA: We are slightly different. So, we... or Switzerland
6416 realized that we have different actors with different roles, and
6417 for us the most, or one of the most, important things is that
6418 there was a neutral process on there. You know, you are the
6419 implementor because you have to build something, and if you are

6420 at the same time the owner of the process to get all these
6421 decisions through, that doesn't work because you play two roles
6422 at the same time and probably even play three roles. So that was
6423 the first thing, that it was very clear each organization has
6424 one clear role, not several roles for the same person.

6425

6426 And then the next thing was as you said already, understand the
6427 community where you go to, and that somebody completely
6428 independent and neutrally has to do that.

6429

6430 ENGSTROM: Yes.

6431

6432 ZUIDEMA: And that then went to the process owner. And the third
6433 thing is the process owner, together with everybody that was at
6434 that time knowledgeable or involved, started to develop some
6435 sorts on how one could organize the local process—not dictate
6436 you have to do it, but as input—because the experience we have
6437 seen is that the communities for them is absolutely new. You
6438 know, they are not professionals in that area, and if you don't
6439 give them something to say, "What could it do like this? What do
6440 you think about that?" then you get a dialogue on how to
6441 organize it. If you gave them a blank sheet it's tremendously

6442 difficult. And the other thing what happens if you gave them a
6443 blank sheet is each one does it differently, and later in the
6444 game they find out one or the other that they did it more
6445 stupidly than the other ones, and then they have really bad
6446 feelings. So to somehow give them all the same starting input
6447 information is very valuable. Then they can start to develop
6448 themselves.

6449

6450 LESLIE: Thanks, Piet. Marissa?

6451

6452 BELL: Thank you. So, I actually want to pick up on something,
6453 Bret, you talked about earlier, and this is... so I love the sort
6454 of advice to sort of go back and sort of really dig into and
6455 understand communities and recognize that that's really
6456 important. I've seen it in the Canadian process, and I see it
6457 now, but I want to turn inward and think about sort of
6458 organizationally. And you've already touched upon, Saida, in
6459 terms of, like, continuity, but what are other elements to sort
6460 of building a successful program or process? [Chuckles] I think
6461 that's what happened. You know, what... looking back and looking
6462 back on your experiences and looking at our process, what are

6463 some internal sort of inward-looking lessons learned that you
6464 may... you might share with us?

6465

6466 ENGSTROM: I think Piet and I talked earlier about the
6467 importance of individuals. I think if you ask me, and even if
6468 you ask him because he knows a lot about our program, we could
6469 say that there was this president that was an exceptional
6470 person. Our program rocketed with him because he had... he was
6471 wise, and he could attract people. He formed a team, and this
6472 team worked for 20 years with him. So, choosing the people in
6473 charge is extremely important, wouldn't you say?

6474

6475 ZUIDEMA: Yes, and probably sideline... [chuckles] and there you
6476 have... you are in a difficult situation because your government,
6477 you know, that you have these changes politically, and that is a
6478 big difference in Europe that some of the organizations here, we
6479 are private... and that gives you also the flexibility, and,
6480 again, these are the different roles. You know, it's really nice
6481 that you are an organization that is not political that is
6482 implementing facilities, and then you have longevity, stability,
6483 and you can act actually. You can act. Your president, he was
6484 able to act and not have to run to Congress every time for every

6485 small details, and I think that that makes a huge difference,
6486 you know?

6487

6488 LESLIE: Okay, thanks. And, Nathan, I know I'm already a little
6489 over, but I'm going to give Natalia a chance to ask a question,
6490 and then we'll jump to the Board for some questions.

6491

6492 SARAIEVA: Thank you. So, my question is, we talked a lot about
6493 the stigma around the facilities, especially in the beginning of
6494 your processes, right, and the negative perspectives from
6495 communities, but once you selected, or were close to selecting,
6496 your host communities, would you say that this perception... I
6497 mean, the perception has changed, but would you say that your
6498 host community has a sort of... feels pride of being a host of
6499 that community, and if yes, what would you think led to that
6500 change of perspective?

6501

6502 ENGSTROM: Well, yeah, we had actually to do some work about
6503 image. Also, some social work in how you perceive... it has to do
6504 with you. You can think that we are going to accept a waste
6505 dump, or you can think that you are taking a national challenge
6506 and solving it locally and, hence, having a lot of skilled

6507 engineers moving to your community and making the competence
6508 level in the community much higher than it was in the beginning.
6509 That's a choice you have to do, and you have to have the help to
6510 do it. We could give that help to the communities with lots of
6511 workshops with researchers that can show them what they can
6512 master... their... you know, ideas about what they want in their
6513 community. And this is how it happened actually, and now they
6514 are extremely proud. I mean, if you met the mayor of Forsmark, I
6515 think you did, he's extremely proud of the facilities that he
6516 has in his territory. But it's a work to be done, and it's a
6517 decision that's made in the beginning by the community
6518 themselves, but they have to be... to have some support in
6519 reaching the results they hope to get.

6520

6521 LESLIE: Thanks. I'm going to turn to Board questions. I'm
6522 looking around. Anyone? Steve?

6523

6524 BECKER: Always happy to ask a question. Steve Becker, NWTRB.
6525 So, I'm about to ask a difficult question, and I don't imagine
6526 that it will get a definitive final answer today, but I think
6527 it's worth asking to maybe start a process of considering it.
6528 So, there are various measures and indices of trust in

6529 government, and when we look at them and we look across
6530 different places, we see that populations in countries such as
6531 Switzerland, Finland, and Sweden are considered to have very
6532 high levels of population trust in government. In France and the
6533 UK, the levels of trust are somewhat lower, but in all of these
6534 countries, the score, the trust score, is significantly higher
6535 in terms of trust in government than in the U.S. How can this be
6536 taken into account as we think about crafting a successful
6537 consent-based siting process here? And I'll let anybody who
6538 wants to take a shot at that and get the conversation going go
6539 for it.

6540

6541 [Laughter]

6542

6543 URIBE: Steve, I'll bite first. It's a great, you know,
6544 observation and one that we continually talk amongst ourselves.
6545 It was reflected in the comments received in the RFI. It's
6546 reflected, you know, in workshops and things like that. Part of
6547 it at least is understanding and changing the mindset, right?
6548 When you look at the work that we're trying to do with the
6549 consortia, it starts perhaps with a bit of humility in the sense
6550 that we're reaching out for you... or to you for help, right, with

6551 trying to address and solve this problem with us. There was
6552 discussion in prior presentations about the decide, announce,
6553 and defend approach, and I think the fact that you start by
6554 recognizing that's not the right approach is in and of itself a
6555 step in the right direction. That's just one example.

6556

6557 Part of that aspect as well is establishing the relationships
6558 with communities, with academia, with state and Tribal partners,
6559 and it takes time. But part of that is attending those events,
6560 you know, encouraging people to pick up the phone and call, and...
6561 but the point being is it starts with the recognition that we
6562 know we have that to overcome and looking for ways to always
6563 further improve the process and get us step by step in the
6564 direction where we gain that trust.

6565

6566 LESLIE: Thanks, Juan. You don't need.. no one else needs to
6567 answer if they don't want to, but if you have something to add.

6568

6569 BELL: I've... from the perspective of a social scientist, I have
6570 found this quite fascinating, and also, clearly, you know, I'm
6571 not originally American. I'm British, and so... I think there's an
6572 NPR article out there that distrust in government is as American

6573 as apple pie based on how the U.S. government is set up, checks
6574 and balances, based on something about tea in a Harbor
6575 [chuckles]. So, but... so I think that the cards are stacked
6576 against us in terms of distrusting in government at large.
6577 Distrust in DOE is a whole other level, but I do think... and
6578 perhaps it goes back to, say, this point about continuity, and I
6579 think that you can have... you can start to build trust in
6580 individuals and in programs, and we've had recommendations from
6581 Tribal Subject Matter Experts' trusted programs, so we can
6582 utilize partnerships where there's existing trust in
6583 institutions, and I think that is part of the goal of the
6584 consortia is that there are institutions out there that have
6585 trust from their communities and that we can capitalize...
6586 actually that's a terrible word for it [chuckles]. We can build,
6587 we can build on that, and utilize that trust to sort of rebuild
6588 trust in a way.

6589

6590 So, I think that, like, yes, it's a huge challenge, but I don't
6591 think it's insurmountable, and I think that, yeah, trust in
6592 individuals... and I saw that in the Canadian process as well
6593 where if you trust in individuals then you can trust in

6594 institutions and things like that. So, yeah, a little bit of
6595 optimism [chuckles].

6596

6597 LESLIE: Thank you. Any other Board questions? Scott?

6598

6599 TYLER: Well, in following Steve's lead on difficult and
6600 challenging questions, it just strikes me. Piet brought up the
6601 question that... or the challenges that we have in our government
6602 of changing every four years, or every eight years or every two
6603 years, and yet we do have a law in place that has been in place
6604 since 1987 which has not changed, and it is... in my entire career
6605 that law has been in place, and so we do have some continuity
6606 that's out there. But I guess my question is, the public
6607 perception, my sense is, is rapidly changing with respect to
6608 nuclear energy, driven in large part by understanding of climate
6609 change in the U.S., so how can we use that change or recognize
6610 that change in our processes going forward to move forward
6611 towards at least an interim storage facility? Are there... what
6612 can we take into account or change our thinking when our... the
6613 perception of nuclear power now has changed in comparison to
6614 when I was a young person and working on this?

6615

6616 SARA EVA: I think it's a big help for us, but it's not enough.
6617 Again, the perception is changing, but, and as you mentioned
6618 it's changed rapidly, but there's still a lot. Also... now I've
6619 lost my train of thought here [chuckles]. I think it's... our
6620 conversation with Saida about the perception of the facility
6621 itself, right, is it a nuclear dump, or is it a highly
6622 engineered, really technical, best-of-the-country minds in this
6623 area combined with lessons learned from best international
6624 expert facilities? So, what is it?

6625

6626 LESLIE: Okay. Dan, you want to contribute?

6627

6628 BULLEN: I'd actually like to take Natalia's comments one step
6629 further. You mentioned the Nuclear Waste Policy Amendments Act
6630 and the Nuclear Waste Policy Act. DOE has its hands tied right
6631 now because they can't build an interim storage facility until
6632 they have construction started on a deep geologic repository.
6633 That being said, there are still approaches that you can make
6634 that may be helpful to DOE, and I actually harken back to an
6635 intergenerational equity conference that I went to that was put
6636 on by KASAM in Sweden. I think it was at Saltsjöbaden, so I
6637 don't know...

6638

6639 ENGSTROM: Saltsjöbaden, yeah.

6640

6641 BULLEN: Yeah. And Camilla Odhnoff who's already been referenced
6642 earlier this day closed the conference out with some very
6643 profound words that I've always remembered, and this may help if
6644 you want to talk to a community that may think they're going to
6645 be a de facto repository if you want to take a look at the waste
6646 as a resource as opposed to a waste. And Camilla said, "Waste is
6647 what you have when you have when you have no more imagination,"
6648 and so that was a great thought that's been stuck in my head for
6649 almost 30 years, or 25 years now, and I have to tell you, there
6650 are resources that can be drawn from the waste if we so choose.

6651

6652 DOE's hands are tied right now because they can't pursue that
6653 avenue, but if we got the Congress to change the legislation and
6654 we decoupled the repository from the interim storage facility
6655 and we looked at the resources that you could bring to bear at
6656 an interim storage facility to investigate uses for spent
6657 nuclear fuel, then I think you have a little bit brighter path.
6658 Maybe not the brightest path, but a little brighter path toward

6659 moving toward the resolution of the problem. So, thanks for
6660 bringing up the Waste Policy Act.

6661

6662 LESLIE: Other Board members? Brian?

6663

6664 WOODS: Yeah. So, you know, I think especially this morning when
6665 we heard... oh, Brian Woods, Board. What we heard this morning I
6666 think was a discussion about change, right, especially in Sweden
6667 or Switzerland, right? There was a... been a lot of change over a
6668 number of years, and I do... regarding nuclear wastes and how we
6669 approach it. Now, I do realize that no one's crystal ball is
6670 very good, but I'm just kind of curious in your opinions, and
6671 anyone can take this question. Is there any change in the future
6672 that you see coming, you know, coming at us that is going to
6673 basically challenge our assumptions around nuclear waste going
6674 forward? So, I'm kind of asking you to look a little bit into
6675 the future and let me know what kind of change you think is on
6676 the horizon.

6677

6678 ZUIDEMA: Wow. I'll give you half an answer. I think fantasy
6679 should stay open, but that should not exclude that we implement
6680 a solution that can be used. You know, there are other things,

6681 and that is that if you don't start now and we wait for new
6682 developments, you know, that we don't do anything, and I think
6683 at least in Switzerland it's very clear, you know, we want to
6684 implement a repository, we want to put things there, but we have
6685 not yet closed it, and that gives time. But if we... the danger is
6686 otherwise that you have a good excuse to do nothing, and that's
6687 what we in Switzerland are clearly against. We should find a
6688 solution now in how far and in what level of detail we will use
6689 that. That's another question, but we should find a solution
6690 today.

6691

6692 ENGSTROM: I think for my part, what I can see... we still have
6693 one final repository as I showed this morning to site in the
6694 mid... we stopped the siting in the mid '30s, and it should be in
6695 operations according to plans today, mid '40s, the one for long-
6696 lived level waste. My... what I can see today is that knowledge
6697 management is a big challenge. When all these skilled people
6698 moved, retired, they had things in their minds and know-how that
6699 is not necessarily picked up by the younger enthusiastic
6700 engineers joining today, so we have a shift, and in that shift I
6701 can see that lots of knowledge can get lost. That's something
6702 that scares me a bit, and it goes very fast. It goes just too

6703 fast, so I think if many of us have challenges at least for 100
6704 years ahead with our facilities, one should think about
6705 knowledge management early in the process.

6706

6707 LESLIE: Piet?

6708

6709 ZUIDEMA: Can I make a very short remark on this, because I
6710 think it's really important. You know, what we do is very
6711 primitive technology, to be honest. Really primitive technology,
6712 and I see it with my children. You know, that's too primitive,
6713 you know, for their brains. They are sharp thinkers, and I think
6714 the key issue will be to attract bright people, and there we
6715 have to be really careful. I think it's very good that they are
6716 primitive systems because they have no moving parts, and that's
6717 why they stay there for long million years, you know? And
6718 that's... so it's excellent technology because it's primitive
6719 because it has to survive one million years, and the robots and
6720 the Teslas and all that won't survive for one million years, so...

6721

6722 LESLIE: Okay. Anyone have a question for someone else? If not,
6723 I've got some questions. Tissa, go ahead.

6724

6725 ILLANGASEKARE: Tissa Illangasekare, Board. So, this question
6726 I'm going to put on my [unintelligible] hat. So, in my field
6727 where there's a field... a field called socio-hydrology. We also
6728 understand social aspects of hydrology, so my question is, one,
6729 your consortia, is there other... are you looking at, again, the
6730 capacity building, are you looking at academy programs adopting
6731 this type of idea like engineers or nuclear engineers taking
6732 humanity classes? It is happening to some extent, but is some of
6733 these plans you have the future for universities? Do they have
6734 that type of thinking?

6735

6736 URIBE: So, I'm not sure I fully understood the question, but
6737 it's whether universities would... is it the universities that are
6738 part of the consortia or just any university that...

6739

6740 ILLANGASEKARE: That is part of the consortia.

6741

6742 URIBE: That they would then take what they learned here and
6743 institutionalize that...

6744

6745 ILLANGASEKARE: No, academy programs that include these new
6746 areas where engineers have to think the social content...

6747

6748 LESLIE: You'll remember we had the social acceptability and
6749 technical suitability. I think what Tissa is trying to say is
6750 some of the universities are merging that as part of the
6751 curriculum, so have you thought about that? Again, because what
6752 we've heard today pretty much is just been on the consent-based
6753 siting, but it's... it would be a lost opportunity if you weren't
6754 thinking about how to bring the technological side of it along
6755 as well.

6756

6757 URIBE: So, I can partially respond to that by saying that I'm
6758 not sure how the folks in universities participating would take
6759 that and translate that into the academic programs, but I do
6760 know that most of the consortia... I think it's seven academic
6761 institutions, the primary entities that were selected, and those
6762 that were not academic institutions have partnered with academic
6763 institutions, and I'd say a large percentage, most if not all,
6764 have involved students as part of the partnership with those
6765 universities. And so I would feel really confident in saying
6766 that the lessons learned throughout this process is something
6767 that they're going to take back and look for ways to implement
6768 and institutionalize, especially if we continue with robust

6769 funding and new or additional funding opportunities that come up
6770 down the road in the consent-based siting process where perhaps
6771 some of these academic institutions can further apply, and
6772 that's where you see the continuity coming in.

6773

6774 LESLIE: So, I've got a question. Bret Leslie, Facilitator, to
6775 try to keep the process moving on. We heard a little bit, and I
6776 think it was Marissa that was talking about the tools and kind
6777 of the GIS base. Piet, when you were dealing with the public,
6778 were they actually dealing with GIS, or was there something that
6779 made it more simple for the people to use because there's this,
6780 you know, learning curve for GIS?

6781

6782 ZUIDEMA: Well, yes. That was in our case a success story
6783 because we were able to give these people a tool that was very
6784 easy to handle, and after half an hour of instructions they were
6785 able to do it, and then they realized what it means for siting
6786 service facilities where it's very densely populated. You have a
6787 lot of conflicts, and that was the breakthrough because suddenly
6788 they realized that it is not easy, and suddenly they realized
6789 that our proposals had some thought behind it, and they suddenly
6790 realized that if I put my alternative thoughts in I will have

6791 other conflicts. And then the nice thing is we were at the same
6792 level, you know, otherwise you tell them always what you do, and
6793 now they told us what they had done. Then you're an equal
6794 partner, and then work with communities becomes productive. You
6795 know, if you're at the same level and you are eye to eye, that
6796 was, for me, the real success that we were able to bring them up
6797 to the same level as us. So, these tools, you have to think
6798 about what's most useful for you, but if you bring up the
6799 community to a level that you discuss an issue and not just
6800 fight each other, then you are really good.

6801

6802 LESLIE: Saida, was there anything in SKB's development that
6803 really helped, again, to explain the technical things? Any
6804 specific tools, or you just kind of used the people to explain...

6805

6806 ENGSTROM: No tools...We bought... we paid for experts, independent
6807 experts for the community, and we had our own experts. So, with
6808 the help of their experts, the experts that the community have
6809 hired, could help them understand and ask the questions. They
6810 would help them to find key questions to ask us, and that has
6811 been taking place for years. So, no specific tools, just basic

6812 communications between our experts and the community and their
6813 experts.

6814

6815 LESLIE: Go ahead, Piet.

6816

6817 ZUIDEMA: If I may comment briefly on this. You know, because
6818 I'm proud of that, you see now. [Chuckles] But anyway, yeah,
6819 those experts versus experts, but the key difference was that it
6820 suddenly was not the experts, but it was themselves, and that's
6821 obviously a special case in Switzerland because we have these
6822 densely populated things, etc. But I think if you can find
6823 something where the people themselves become part of the
6824 process, they have it under control, and for us that was really
6825 the breakthrough that they found out we can form our opinions
6826 ourselves without an expert.

6827

6828 LESLIE: Any final questions from DOE to your counterparts?

6829

6830 URIBE: I'll ask a question to Dan, and maybe if Saida or Piet
6831 want to jump in, but it's a concept that I hear a lot, and it's
6832 the importance of having a champion for your cause, right,
6833 whether it's at the local, at the state, or at the federal

6834 level. As I was looking or listening to your presentation, I
6835 heard you say... I think... I didn't get a block, but it wasn't
6836 necessarily support either, so can you talk or can you speak to
6837 the... from your perspective the importance of having a champion
6838 at whatever level, and maybe others can share their views?

6839

6840 BULLEN: Yeah, it's all about credibility, and so a county that
6841 I went to, the person that was our personal friend was one of
6842 the manufacturers. He was that upstanding member of the
6843 community-school board, library board, theater board, park
6844 commission—and did all of those things, and so he was well
6845 recognized. So, when he helped introduce me to the Economic
6846 Development Corporation he had credibility, so I had
6847 credibility. The other thing you might have seen if you looked
6848 closely at those newspaper articles was the one that was from
6849 the *Corydon* newspaper that basically said that my wife was the
6850 daughter of Lyle Clark, a resident of Wayne County, and so that
6851 was the ability to get in with a little bit of credibility.

6852

6853 Now, the champion is the problem, and you have to have the
6854 champions on multiple levels, so I had someone who at least got
6855 me the introductions. And, again, I didn't see the fact that

6856 economics was going to bite us a little bit later, but I also
6857 had the opportunity working with the Nuclear Waste Negotiator
6858 staff, particularly Mr. Lempesis and Mr. Mussler. They did a
6859 really good job of talking to the governor. I mean, even though
6860 I was an Iowa State University professor, the governor is not
6861 going to answer my call, okay? That's not going to happen. And
6862 having the Nuclear Waste Negotiator's office, if not the Waste
6863 Negotiator... so David Leroy never came to Iowa, but he was on the
6864 phone with our governor, and so that was a little bit of an
6865 intro to get it going.

6866

6867 Now, I don't know if that was a benefit or a detriment because
6868 the words "I'm from the government, and I'm here to help" don't
6869 always ring true, but at least we had the opportunity to say we
6870 had connections at the federal level, the state level, the local
6871 level, the county level. Having the champion to develop would
6872 have been a lot better had I done a better job at the state
6873 level and at the local level, but again that was communication,
6874 and in my case it was a little bit artificial because we had
6875 these deadlines for the grant applications that were very short.
6876 So the first grant application actually passed before we got an
6877 opportunity to apply, and the second application, even though it

6878 was delayed I think six months, it still was only March after we
6879 started in June. So, the champion is important, but actually,
6880 again, the timing is important too, and I would counsel looking
6881 at both these programs. It's going to take a generation to do
6882 what you guys are trying to do, so if you're in for the long
6883 haul it's going to be about 20 years before you can look back
6884 and say, "We've got some good progress," and we're going to
6885 have, you know, continued opportunity to get a community based,
6886 consent-based site. So, yeah, a champion is important, but thank
6887 you.

6888

6889 LESLIE: Thank you, Dan. And with that I think... we'd like to
6890 thank all of you for some thought-provoking conversations and
6891 good questions, and I'll turn it over to Nathan at this point,
6892 but if you can just stay there until we wrap up.

6893

6894 SIU: Yes. I do want to add my thanks too. This has been very,
6895 very informative. Okay, we're in our public comments part of the
6896 meeting. We have three people who've signed up to give public
6897 comments, so I'll just call each of you in turn. We do have some
6898 time, but I'll ask if you can limit your comments to five
6899 minutes, that would be very appreciated so then we can all get

6900 out at 5:00, and then there's, of course, an open house
6901 afterwards where we can chat more informally. So we'll start
6902 with Andrew Newman from Idaho National Laboratory,... if he's
6903 still here.

6904

6905 Q: He signed the wrong form.

6906

6907 SIU: Okay [chuckles]. That makes it simpler. Okay. Tami
6908 Thatcher? Hello, Tami.

6909

6910 THATCHER: Hello, I'm Tami Thatcher. I live in Idaho Falls. Yes,
6911 can you hear me? Okay, I was at one of these Nuclear Waste
6912 Technical Review Board meetings a few years ago, and I have to
6913 say, this was a different sort of show put on today. I followed
6914 the consent-based siting, and I testified over in Boise. I guess
6915 it was 2017, and I spent a lot of mileage and a lot of time
6916 commenting, and then the Department of Energy deleted all of the
6917 comments, all of the public comments, that it had obtained for
6918 the last exercise for consent-based siting.

6919

6920 I follow nuclear issues. I write about reactor safety, radiation
6921 worker health issues, and nuclear waste cleanup at the INL,

6922 etc., and following this latest consent-based push which tries
6923 to not say it's just the above ground storage we're going to put
6924 somewhere without any plan about where it's going to need to go
6925 for disposal or for reprocessing, and if the idea is to use it
6926 as a resource, your EIS needs to include reprocessing and where
6927 that pollution from reprocessing is going to go and where the
6928 waste from reprocessing is going to go. But to build an above-
6929 ground storage facility without a plan for where you're going to
6930 dispose of that waste, without even a plan of how you're going
6931 to repackage that waste as those thin-walled stainless steel
6932 canisters experience stress corrosion-induced, ... chloride-
6933 induced, stress corrosion cracking, it's so short sided it would
6934 be laughable if it were not so seriously being entertained.

6935

6936 I see this week that a Court of Appeals has realized, that, yes,
6937 we have laws that say you can't have an NRC license for this
6938 kind of storage with this kind of short-term thinking. NWPI...
6939 NWPA law prohibited it. There's a very limited amount of storage
6940 that was allowed in an MRS, a very small amount of storage, and
6941 DOE's not even being transparent about what size of an MRS it
6942 would entertain when that is a very limited size by law right
6943 now, and the challenges to the facilities in New Mexico and

6944 Texas are now put on hold. Their state legislatures are not
6945 happy with not having any consent about those facilities, and
6946 they were unlawful to begin with because of the NWPA laws that
6947 said you can't have this temporary parking lot dump,
6948 consolidated dump, until you have construction on a disposal
6949 facility. Now, it's been admitted here that Yucca Mountain is
6950 not considered viable. No, it's not, and we have, by law,
6951 limited that to 70,000 metric tons of spent fuel. Others will
6952 argue it could hold more. We expect to have 140,000 metric tons
6953 of spent fuel in two decades. That's two Yucca Mountains the
6954 size specified by law that's generating 20% of the U.S.
6955 electricity. So, if you're going to make a dent in climate
6956 change with nuclear, you're going to need a Yucca Mountain
6957 repository every year or two.

6958

6959 So, the short sidedness of this consolidated effort is
6960 concerning to me. The radiation health issues, well, I can go
6961 online to the Health Physics Society website, and it says
6962 there's no discernable health harm below 10 rem, when in the
6963 1950s Dr. Ellis Stewart saw discernable harm to an embryo x-
6964 rayed in utero under 500 mrem, doubling of cancers. When the
6965 radiation health issues are not being kept up to date. You've

6966 got radiation worker epidemiology—300,000 workers—low dose and
6967 low-dose rate, and their cancer rate to adult men largely is
6968 higher than what the study of Japanese World War II bombers
6969 would indicate... bombing would indicate. Radiation, you want
6970 informed consent, and you're not updated based on the science
6971 for radiation health, and you're not looking at the health harm
6972 to the unborn and to children. It's very short sided, and so I...
6973 I really feel so sad and pessimistic for our future generations
6974 with... with what's going on. I'll end there. Thank you.

6975

6976 SIU: Okay, Rod McCullum, NEI

6977

6978 MCCULLUM: Yeah, Rod McCullum, Nuclear Energy Institute. I work
6979 for the organization that represents the waste owners, I believe
6980 was the title given to us earlier today, and we're the folks
6981 that actually give the folks that are working this problem the
6982 opportunity to move at the speed of trust, which is very
6983 important. We've become very good at managing used fuels on our
6984 sites and extending the storage times for used fuel, and in your
6985 separate meeting tomorrow you're going to hear about one of our
6986 favorite projects in that regard. I really have just a two-word

6987 public comment. After a little preamble I'll explain what that
6988 means, but institutional momentum.
6989
6990 DOE is at the very beginning of a process which we have seen
6991 with these countries and others that have been very successful.
6992 Again, you do have to move at whatever speed trust allows, and
6993 that is going to be slow. It's hard to earn trust. So, you know,
6994 there's a lot of policy things that could be done. You know, we
6995 talk about repositories and laws and all of that sort of thing.
6996 Your technical review board, much of that is beyond your scope
6997 and above my pay grade, but we can only do what we're empowered
6998 to do today, and that gets me back to this institutional
6999 momentum. What you've heard today is very informative and a lot
7000 we can build on. You have a voice. You write to Congress, you
7001 write to the Administration to the extent that you can recognize
7002 progress, to the extent that you can say things that help us
7003 build on the international experience. You know, we have this
7004 deal, and after 20-something years in this end of the business
7005 I'm tired of hearing, you know, every election we change
7006 direction. We go back to square zero. That's why I bring this
7007 term "institutional momentum" up.
7008

7009 This Board can be part of creating that to the extent that you
7010 recognize and encourage what's going on here and recognize, of
7011 course, that it's at its very beginnings. We've got all these
7012 consortia, some of them are in the room today, and they're all
7013 over the country. You know, they represent red states and blue
7014 states. Perhaps this can now become a journey that continues
7015 from administration to administration. Again, there's policy
7016 changes that could help that, but that's out of our purview. So,
7017 I encourage the Board to, you know, be part of moving this thing
7018 forward, and that's all I have to say. Thanks.

7019

7020 SIU: Thank you, Rod. Okay. With that, I do believe we've
7021 reached the end of... Bret, do you want to say anything about the
7022 online comments?

7023

7024 LESLIE: Well, actually one other thing. Are there any people in
7025 the audience that didn't sign up and want to make a comment?

7026 Fair enough.

7027

7028 SIU: Could you introduce yourself please?

7029

7030 ARAUJO: My name is Kathleen Araujo. I direct the CAES Energy
7031 Policy Institute that's based at Boise State University. With
7032 our institute we look at social and technical aspects of energy
7033 system change. I'm also a Professor there of Sustainable Energy,
7034 and perhaps more germane to today's conversation, I'm here with
7035 members of our team and related partners who are in discussion
7036 to stand up a number of the consortia that are under
7037 consideration.

7038

7039 So, taking the long view, and I'd love to hear from the
7040 different groups here, and going back in time to 1982 and then
7041 extending it to today, what do you see that gives you... do you
7042 see as promise that we can successfully do something different
7043 about consent-based siting with all the experience and the data
7044 points that we've been hearing about? I'd love to encourage you
7045 to say more than just experience, so I open it up to anyone
7046 here. Thanks.

7047

7048 SIU: Well, that's a great question, Kathy. I'm sorry, this is
7049 just... you're providing comments to the Board. There will
7050 certainly be opportunity to talk afterwards in the open house

7051 and certainly I'm sure opportunities after that if you want to
7052 continue engaging. But I appreciate the question.

7053

7054 LESLIE: So, yeah, I can say something about the online
7055 comments. We've gotten about 35 online comments, and we're in
7056 the process of putting those online tonight. I appreciate it. I
7057 didn't pay as much attention as I normally do because I had more
7058 jobs today, so-to-speak, but even the feedback of telling your
7059 speakers to get closer to the microphone was helpful, so we do
7060 value the logistical questions, but also some really good
7061 questions that are going to inform our visit to Canada actually,
7062 so...

7063

7064 SIU: Okay. With that, I think we can actually say that we have
7065 finished a tad early, four minutes. So, with that, thank you
7066 again, and we'll call it a day. Okay. Yes, the open house will
7067 be after this, and also there's exhibits. Please take advantage
7068 of them.