Enclosure 3, Significant Comments Made During the NRC Standards Forum (aligned to agenda topics)

Agenda Item	Significant Comment
NRC Standards Forum Overview	• Jim Riley – Observation re: Project AIM and effects on standards committees. Any change that makes you less engaged may lead to exceptions and limitations to standards – not a productive result. "Circulating around the industry" is the question of what controls NRC can apply to the industry. They should be based on NRC's safety mission (not only how they want to do things). What are the criteria that apply to exceptions and limitations? • Tom Boyce – We are working to minimize the need for exceptions and limitations by engaging management earlier, as the standards are being developed, to reach alignment on any limitations. But we have to do with less resources, so there will be an effect – we're trying to manage it. • Tom Boyce - What we will request is that you (here in the room) get someone from your organization to participate in development of these potential topics for standards. The Forum will be (hopefully) more participatory than in the past. We need to have Champions to take an issue forward. • Prasad Kadambi – What is the process for a Champion to bring an issue forward, and find out what the NRC thinks? Tom – When a project team first forms, an NRC participant on the call will give an initial reaction and help the team decide whether to move forward. • George Flanagan – You said "NRC will support working groups (WGs)." What does "support" mean? Tom Boyce: Using the HDPE example, NRC held a workshop to move things forward, and then endorsed the resulting Code Case. We cannot promise research funds, but we will set up conference calls to bring people together. • Success for this Forum is to determine that there is interest, and decide to take an action forward.
Summary Review of Standard Forum Activities	• Ryan Crane (ASME) – The items under #1, Envir. Fatigue – work is progressing under Sec III. Piping, we are not sure if it's assigned – will get it to the right committee. #5 Aging / NDE – will work with ASNT and ANDE committee to fill in some gaps in NDE techniques. • Tom Koshy (IEEE) – Cables – a joint standard was issued in Feb. for condition monitoring. But for current cables, it cannot be used because initial testing was not done. • ACI - With regard to concrete repair, there should be a continuing interest in working with NRC. ACI had a significant committee action that led to release of 1st design code for repairing concrete, which came out in last 2 years. NRC sent a letter to head of ACI and tried to request committee action on steel/concrete composite and improvements to ACI-349. The top-down approach was not effective. We need to get to specific committees. • From Webinar (Sanj Malushte (Bechtel)): Heard mention of steel plate composite walls. AISC issued a standard 8/2015, now under review by NRC. RG 1.225 will reference it. I was the founder of that AISC committee, and worked with NRC – we had several meetings. Separate question – If a standard already exists, how can we get NRC to act upon it? For example, seismic base isolation. ASCE-##? & 43 (2016) will have design requirements. Would like to get NRC review & endorsement. • NRC: Standards that were cited in applications (AP 1000) got NRC's attention, and we would deem that a success case. In the case where you have a standard in progress, need to articulate what is the demand from the end-user. That would signal NRC that there is potential for use in an application that NRC will be reviewing, so NRC will leverage its resources. For AISC N-690 (composite), there was much collaboration with NRC and DOE during standard development. • Sanj Malushte – For seismic base isolation, there is a need for a standard. If there is anything industry can do to get more dialog, interaction with NRC, get comments, please let us know. ASCE will be the SDO for this issue, and I am informal representative. • Concrete report & concrete repair – ACI rep. confirms this is complete. • Polymer pipe – agree that this, too, is complete (or can be discontinued).

	• Accident tolerant fuel – No forum interest? Will discontinue (for now). • Fukushima – One item was recommended, IEEE 497. Tom K: Fuel pool instrumentation standard was approved (as a new working group) at last NPEC meeting (7/2016). P. Kadambi: That proposal was part of something ANS had proposed, regarding monitoring conditions after severe accidents. T. Koshy: The IEEE standard will include severe accident conditions. K. Cozens : As far as the Forum goes, we will declare victory. • NEI documents to standards – Jim Riley: We talked about this generally at NEI. We did not identify any, but will think about it as we go. Gas accumulation guidelines might be a candidate. R. Crane: ASME works with NEI. We can track it as part of this Forum, too. K. Cozens: The ASME O&M committee will be looking at gas accumulation guidance. • Risk related standards – T. Boyce: We are in pre-planning stage. This is a place-holder. We know that ASME is the lead with regard to risk standards, in conjunction with ANS. The Commission gave the staff direction to document advances in risk-informed regulation. The NRC is looking at updating RG 1.174.
EPRI Advanced Nuclear Technologies – A standards feeder	• Nuclear sector is by far the largest in EPRI; it includes the ANT group. The EPRI nuclear sector does research that covers the entire spectrum of design and construction, toward operations. The EPRI nuclear sector divides its research into 3 "technical focus areas" (slide 8). Modern Technology Application: augmented reality, drones, cybersecurity, facial recognition… EPC projects: Those in gray are those we do not expect to have direct bearing on standards activities (although we could be wrong, or it could change). • Details on the EPRI sides define research being executed or planned and the relevance to standards development. Bechtel: ACI 349 is a dependent standard on ACI 318, but 318 committee has not had much interest because of limited ductility in hi-strength rebar (not sufficient for commercial applications?). ACI 349 may need to take the lead. Several from Bechtel are involved in the key committees. RES/DE: Success for this forum is to get Champions signed up. We understand it may not be a firm commitment, but an initial step (maybe to find a champion). • Why ACI 301, not 207? Response: ACI 301 is a requirement document, but 207 is guidance. So that is why EPRI prefers to target the ACI 301. • DOE: General question re: powder metallurgy work. DOE received a great presentation by EPRI staff, focused on ASME Sec II. Any plans for nuclear grade qualification under Sec III? EPRI: Looking at Sec II and ASTM B-834? Materials include Alloy 600, 690, 718. Some potential for Sec III, but main focus on is on Section II. • IEEE: Advanced batteries – IEEE has standards on Valve Regulated Lead Acid (VRLA) batteries and on choosing batteries. This is not directly under NPEC, but NPEC will be glad to connect EPRI to these other standards committees.
Update on MD 6.5, Staff Participation on SDO Committees	• Revised MD 6.5 is expected soon, a public document. Standards Steering Committee is being created – at Division Director level. • NRC: If staff voices a position during committee meetings, it generally represents consensus of staff on the committees, but it gets revisited during the rulemaking process. • Chris Sanna (ASME): The complexity of standards development sometimes affects NRC participation. For example, not always the best engineering judgement of an individual, but a consensus position. But interpreting silence is difficult – no position, or none yet developed, etc.? Some proposals affect primarily overseas members. Ambiguity is a concern. No vote affects quorum counts, does not communicate clearly. • NRC: The staff are given direction to use best technical judgement. Also, new (formalized) role of SDO Coordinator is being established. We expect that person to coordinate consensus views, preferably early in the process and not only during rulemaking. We should speak with one voice at a meeting. • NEI: Because of significance of NRC's exceptions & limitations, they would be rolled through this Technical Forum? I encourage that, as limitations should get "scrubbing." There could be an avenue for discussion through the Steering Committee, if there's a "hard spot" between the industry and regulator. • NRC: ASME has management meetings with NRC every 6 months, and that seems successful. If there's a concern with an NRC vote, it could be brought up there. Other SDOs could take this approach. • The list of NRC representatives on committees is being revised (always, annually), and it will be a public list on website.

	• NEI: NESCC undertook some project to understand where standards were being used. Was that done? NRC/RES: We had an early database under NESCC, with ANSI's help. We've since worked in-house, looking at all uses of standards in RG, CFR, SRP, etc. We can't open the database (live), but staff put up reports from the database on our website yesterday. We plan to update it at least once a year.
IEEE	**Digital I&C Activities:** • IEEE 603 is an "umbrella standard," not digital. 603-2009 is being revised. The Commission disapproved rulemaking, and instructed staff to maintain the principles of IEEE 603. It's up to the user to select the technology. We think we now have a standard that can be IBRed, if the NRC decides to do that. Standard 7-4.3.2 – 2016 was released a few weeks ago. NRC is expected to endorse it, with conditions, in a RG. Under development: SFP instrumentation (by WG that does 497 standard); intelligent digital devices; security systems. • NRO: It was mentioned that new standards take years. We're seeing rapidly-evolving technologies, faster than we see from consensus standards bodies. What can be done to make the process faster? Presenter: Resources. The same WG that does 497 is doing SFP instruments. If we had more people, could have separate WGs. For new reactors, it's not so much that functional requirements need to change, it's how they implement them. Separation and independence, data highway, higher level integration – these are the issues now. NEI: We put out NEI-15-01, which is now being rolled into an IEEE standard, so that's one way to move faster. NRO staff: A lot of these standards we're looking at have been developed in international standards; e.g., IEC has cybersecurity standard and EMI/RFI standard. Integrating these may be painful, but we can borrow from them. R. Beacom: One issue from the IEEE rulemaking is common cause failure (CCF). There is no IEEE standard on CCF, but there is in IEC. **Certification of Qualified Electrical Equipment** • IEEE Conformity Assessment Program (ICAP) = Certification. CFSI parts are an industry issue, noted in NRC and CNSC documents. IEEE 323 (1974), endorsed in RG 1.89, is the "mother document" for electrical qualification. Currently, WG chairs are asked to come up with the key elements to be examined for qualification – "refined list." The standard will generate a checklist, and rely on accredited labs to ensure conformance. CA Steering Committee formed in 2014. Lab accreditation will be ensured by periodic audits. Certified products may use the IEEE logo and be included on a public registry. The registry will distinguish 'grandfathered' products from newly-certified. IEEE Certification mark will include a unique NPEC number. • IEEE would like to be considered an international standards body. Signing a memo of collaboration with IAEA in next 2 weeks. If two standards are compatible and being worked on at same time, would try to make a joint-logo standard. With IEC, there are 4 standards available, and one in progress (leakage). Seismic standard will be joint with IEC. • NRC/RES: You've had success in the advanced reactors area. Can you tell us, what is the demand signal? And where to do you get your Champions? Presenter: Our (IEEE's) goal is to come up with standards for the next 2 decades, not focusing on current designs. We are trying to lead, to bring in people to think differently, to reduce vulnerabilities. NRC/RES: Is there some sort of list of IEEE's priorities for the next few years? The NPEC Chair will inquire. On the IEEE website, there is a list of standards to be developed. • From what you said, IEEE is forward-looking, deciding what the demand should be, rather than only responding. True? Presenter: Most of the international newcomers said they are not happy with the current levels of safety, after Fukushima. So, I try to inspire my colleagues to think this way. At the same time, IEEE is the industry, the world – stakeholders (vendors, users, etc.). S. Fleger: Also at IAEA, Gary Johnson was a champion of additional safety. He worked with EPRI on publishing a document on severe accidents. • John Kelley (DOE), Dep. Asst. Sec. on Nuclear, chairs GIF, IAEA standing committee on advanced reactors: For last several years, DOE has partnered w/NRC on regulatory framework for advanced reactors. Working on GDC's for last couple of years. Next, need standard review plan (SRP); SRPs tend to reference a lot of codes & standards. What is the prioritized list of what is needed? He talked with NRO Office Director – could we have a roadmap of what standards are needed? ASME did a roadmap for SMRs. Dr. Kelly took this opportunity to encourage such a roadmap for advanced reactors (non-LWRs).

Advanced Reactors – Research	NRO Presentation: • NEI is working toward demonstration of a non-LWR by 2025; DOE target is 2 technologies by 2030. So, that means applications coming in to NRC around 2025, so we have ~9 years to get ready. Congress: Nuclear Energy Innovation and Modernization Act would require us to develop a risk informed performance based framework for licensing advanced reactors. Nuclear Energy Innovation Capabilities Act would require us to submit a report to Congress on our capabilities to license new reactors. Vision and Strategy document has been published for public comment (to 9/19/16). Currently developing implementation action plans (IAPs), including one on codes & standards. We're further along on General Design Criteria for Advanced Non-LWRs. Expected to come out as draft RG in spring. We are planning, but need stakeholder feedback to inform our efforts. DOE Presentation: • Six Gen IV reactors are being considered (2 seriously): SFR, VHTR. Lead fast reactor – has been tried on submarines; not yet on land. Molten salt reactor – solid or liquid fuel. Gas-cooled fast reactor, Supercritical water-cooled reactor. Integrated LWR SMRs are nearer-term, but not as challenging to standards, and already addressed by NESCC. • ASME Section III Division 5 covers High Temperature Design, incl. ceramic and graphite composite components. Several topics have been identified as needing updates; formed the basis for an action plan. None of Division 5 has been endorsed by NRC. New materials and analytical methods are being considered. SG-HTR developed a list of topics, now endorsed by BNCS & DOE (slide 16). • Sec XI covers in-service inspection. Divisions 2 (GCR) & 3 (LMR) exist, but are obsolete. Division 2 is now being used for reliability integrity management (RIM); Division 3 for system based code (SBC). • Division 2 was originally for HTGRs. After PBMR folded, it was decided to make Division 2 a technology-neutral standard for RIM. SBC allows an exchange of margins, to avoid excess conservatism (maybe). Led by ASME/JSME joint task group based on SFR experience in Japan. • NRO: Instrumentation is going to be key. Are any standards bodies looking at developing instruments for advanced reactors? • NRC: Cables have been qualified for high temperature, but we don't have a standard yet.
ANS Solutions for New Designs of Reactors	• Two Advanced Reactor standards exist: ANS-54.1 (LMR design), as N214; ANS-53.1 (gas reactor design) • Many new standards were proposed, but after Clinch R. closed down, there was a lack of interest in industry, so there were no committee volunteers to write them. In 2013, the ANS Standards Committee (SB) was reorganized. • NRC/RES: Do any of these topics need a Champion or a roadmap, or are they already being worked? ANS: We need roadmaps; we have only identified gaps. There is much work to be done. There is no one organization that can address all the technical issues. We also need NEI to bring in the utilities; and NRC & DOE to man the WGs. But how many people are left in the USA who can work on these technologies? We need to look also to universities.
Other	• DOE/NE is about to embark on a reorganization. B. Corwin will continue to work on materials. • ANS: We need to figure out how to work around immature designs, what companies can reveal that is pertinent to standards development. • NEI: This meeting ended up scheduled at same time as NEI workshop on advanced reactors, so people had to divide time. In future, better coordinate these two, so we avoid competing.