From: Charles R. Ogle , CII
To: O'Donohue, Kathleen; Payne, Charlie; Rogers, Walt; Schin, Robert; Wiseman, Gerald
Date: 4/27/04 9:59AM
Subject: Fwd: RII response to DAFFY 04-045E

I was very impressed with the comments that you all provided on this document. They were well done. Thanks.

A-2

From: Kathleen O'Donohue / RII
To: Perch, Robert
Date: 4/22/04 2:03PM
Subject: RII response to DAFFY 04-045E

The comments and questions from the RII review of Appendix F draft are itemized in the attached document.

Please feel free to call me if you need additional information.

CC: Koltay, Peter; Richards, Stuart

DAFFY 04-045E: RII Review IMC 0609, Appendix F, "Fire Protection Significance Determination Process"

Review Comments:

1. It is not clear that this revision handles multiple findings in the same fire area. How should these be addressed? (page F-4, sixth bullet) It appears that the SDP approach is limited to an individual fire area. What if a finding includes several fire areas? Can we analyze risk by the individual fire areas and then add the risk numbers together to get total risk for the finding? (e.g., one RII plant has about 40 penetration seals that are larger that those that were tested. This finding affects most of the fire areas of the auxiliary buildings for two units.) There needs to be some dialogue as to how to address multiple low degradation findings within a 'compartment'. Each finding independent of the other may screen Green but, when examined concurrently would produce a different result (often White).

2. There is no discussion as to how LERF will be addressed for fire protection findings, other than to acknowledge it as a significance determination metric.

3. This is no discussion as to how fire protection findings associated with shutdown will be addressed.

4. A manual suppression/fire brigade SDP is not included with this draft. Such a document would be necessary for issuance of the revised Appendix F.

5. Page F-5, second bullet: A performance deficiency is defined in MC 0612 as an issue that is the result of a licensee not meeting a requirement or <u>standard</u>. So, should 'nonconformance with standards' be added to this bullet?

6. Page F-7, uses the terms 'fire area' and 'compartment' interchangeably. Better to use only one term and be consistent. The term 'fire area' is already defined in regulations. If the term 'compartment' is to be used, it should be defined.

7. Page F-7, paragraphs 5 and 7: What is the basis for the 20 minutes? Is it based on fire brigade response time? How is fire loading considered? How is fire detection time incorporated? (NOTE: The National Fire Alarm Code, 1993 Edition, Section B-5, Smoke Detector Spacing, shows that ionization smoke detectors are designed and spaced to detect a medium growth rate fire in 5 minutes and a fast growth rate fire in 2.5 minutes.)

8. Page F-7, paragraph 7: Are the combustible or flammable materials located <u>in the exposing fire area</u>? Also, only direct flame impingement on the degraded barrier is considered - what about the hot gas layer? A hot gas layer is more likely to be able to break through the degraded barrier and ignite materials on the other side of the barrier than direct flame impingement. (Hot gas layers have pressure as well as large quantities of hot gas.) It does not seem appropriate to ignore the hot gas layer in this screening, as this may erroneously screen out significant issues.

9. Page F-7: Should the size of the degraded barrier or hole be considered? A large hole in a fire barrier could be more significant than a small hole.

10. Page F-12, chart at bottom of this page: If the Section III.G.2 compliance strategy is a 20 ft. spatial separation, why do you state that the SSD path will not be credited? A RII plant has a large room with the 20 ft. spatial separation in the middle and with equipment in one end of the room credited for safe shutdown from an Appendix R fire in the other end of the room. The NRC accepted this design in an SER!

11. Page F-13, first paragraph: Is the 'SSD Unavailability Factor' equal to .1 or .01, from step 2.1.2?

12. Page F-14: What is FDS? FDS1? FDS2? FDS3? Where are these defined? There is some information related to these terms in Attachment 8, but where are the definitions of the terms?

13. Attachment 2, Table for Unique/Boot Seal, Moderate B degradation - it is unclear whether it is the loss of 2-3" of seal or that is what is remaining to meet this definition.

14. Attachment 2, Safe Shutdown Findings, Low degradation - it is unclear how "straightforward actions, pulling fuse block, installing staged jumper with clear directions" constitutes a low degradation item.

15. Attachment 3 indicates that non-degraded barriers can only be affected by oil fires. Consider inserting an HHR at this point. This is because not all oil fires affect non-degraded barriers.

16. Attachment 4 omitted guidance as to what constitutes low, medium & high loading of cables.

17. Attachment 6, Energetic Electrical Arcing Faults Leading to Fires Section, discusses that a fault may be recoverable if the initial faulting device can be isolated from the feeder circuit. There needs to be some guidance as to the criteria to be used to credit this action - in the fire response procedure, in an Alarm Response Procedure where multiple alarms will be happening (especially with the fire in progress, etc.).

18. Attachment 6, Self-Ignited Cable Fires Section, discusses acquiring additional Regional or HQ staff input if the fuse/breaker coordination is not proper. Perhaps if this is the case, the matter should be forwarded into Phase 3.

19. Attachment 7, Guidance for the Identification of Targets and Their Ignition and Damage Criteria, states that metal pipes and water tanks are invulnerable to fire. We understand the premise. However, the fluid medium within these devices will increase in temperature. Such temperature increases may very easily fail a critical function due to the lack of heat transfer or state change. Also, this temperature increase may significantly increase the probability of relief valve challenges. Also, targets are basically tied to cables. However, electronic equipment fails well below 400°F and a different zone of influence/temperature consideration should be established.

20. Page F-17: What is the basis for the HRR kW values assigned to the Fire Size Bins?

    NOTE: The National Fire Alarm Code, 1993 Edition, Section B-5, Smoke Detector Spacing, states that in the early stages of development of a growing fire, the heat release rate is approximately 250 Btu/sec. or less. (250 Btu/sec = 264 kW) Why are we using different fire size bins than what is already in the National Fire Alarm Code?

    Page F-17, Table, Mapping Fire Type Bins with Simple Fire Characteristics: Since, National Fire Alarm Code, 1993 Edition, Section B-5, states that the early stage of a developing fire is 250 BTUs/sec. or less, for detecting a developing fire in the early stage, would it not seem reasonable that the 95th percentile small fires detected and the fire size Bins (left hand column of table) could reflect the NFPA defined fire sizes; for example, the early stage 250 BTUs/sec. fire = 264KW..... etc.? This approach should give the NRC a valid NFPA technical basis for the listed fire size bins. These fire size bins would then be equivalent to the relative Fire Intensity Characteristics that are reasonably expected to be detected by a normally operating product of combustion (POC) detection system which most plants have installed.

    The table for mapping fire scenarios (page F17) does not define "Very Large Fire Sources." Are they intended to be Yard Transformers from task 2.3.2?

21. Task 1.3.2.1 - how do we determine if a barrier provides a 2-hr or greater fire endurance? Is analysis OK? Or do we need testing in the applied configuration?

22. At Task 1.4.3 any finding with high degradation will always pass thru the screening to the next level. This should just be written as a rule.

23. How do we handle the manual actions deficiencies that are to mitigate spurious operations?

24. What if the manual action is considered "skill of the craft." There is no procedural guidance for skill of the craft (by definition) so, do we give credit?

25. Do fire response / SSD procedures have to be stand-alone or can they rely on using Abnormal and Emergency operating procedures (possibly concurrently) to handle Reactor trip and other equipment upsets / malfunctions?

26. Table "Total Unavailability Values for SSD Path....." Discusses 3 categories of HEPs. However, only 2 are described and only 2 values are given. Also, the table should be numbered for ease of reference and identification.

27. Are there any criteria for acceptable manual actions near or in the Fire Area of Concern? Some Fire Areas are very large and manual actions located physically away from the fire may be feasible. Conversely, some manual actions occur in the room right next to the fire but officially in a separate fire area. There are doorways that are close enough to the fire that the operator access may be impaired by smoke, fire brigade activities, etc.

28. How are SSD total unavailability values used to determine CCDP? That is: what if the strategy uses aspects of all three? What is to be done; sum them? Multiply? Pick most conservative value? How is this to be treated?

29. For energetic electrical arcing faults, do the breakers in question have to be energized?

30. Pg F-20 and 21 contain tables of pre-solved critical distances for thermoplastic and thermoset cables. The lead in (bolded) sentence for the third cable should read as follows: "For a fire near a **corner** (vice near a <u>wall</u>).

31. Page F-21, second last paragraph: Screening should consider the temperature at 30 minutes - is that assuming a constant HRR for 30 minutes? How should that be screened - are we comparing to 400 or 625 degrees F based on type of cable insulation?

32. Page F-23, paragraph on combustible controls program: Where is the transient fire likelihood for fire areas (low, moderate, or high) to be found? These likelihoods are addressed in Attachment 4, page 4-2, but where is the description of what constitutes low, moderate, or high transients?

33. Page F-24, first paragraph: This applies only to improperly stored combustibles - but what if maintenance combustibles (for a job) are routinely left unattended in a fire area and that is allowed by the licensee's transient combustible controls program? Also, needs far more amplification on what is meant by "improperly stored materials". Is it for just the compartment containing the performance deficiency? The whole plant? The site? What is a T/2 type situation arises - is it the T/2 period in question or the T period in question?

34. Appendix F, page F-26, Example 3: Can manual actions to open breakers to prevent the spurious actuations be credited? Some licensees have such actions in procedures.

35. Page F-26, paragraph following Example 5: Systems and functions that are not assumed lost due to a fire will be credited - what does 'assumed lost' mean? What if the SSA assumes that offsite power will be lost, but the licensee verbally claims during an inspection (perhaps in response to a finding) that offsite power will not be lost? Inspector review of such licensee claims has found some most likely to be true, but has found some to be false.

36. Page F-27, last bullet: Operator actions within the impacted fire area will not be considered feasible. What if the operator has two hours to accomplish the actions in the impacted fire area? What if the operator has to only pass through the impacted fire area in one hour to accomplish actions in an adjacent fire area that is not affected by the fire, and the licensee claims that they can always extinguish fires in 30 minutes?

37. Attachment 8, page 8-3, first paragraph: This directs use of the Heat Flux Calculation, Wind Free - however, that spreadsheet from NUREG-1805 applies to oil pool fires. How is that spreadsheet to be used for electrical fires when we have an estimated HRR in kW?

38. Attachment 9 on page 9-1 needs a definition of no degradation of hot work permits and fire watch programs (scope and duration).

39. Task 2.1.3 allows up to 0.01 credit for an SSD path without considering the manual actions outside the Main Control Room associated with that path. Some guidance tempering that credit should be applied. This same comment also holds for Task 2.5.3.

40. Step 2.7 on pg F-31 discusses guidance in ATT. 10 in several places. As far as we can tell there is no ATT. 10 - we believe these references should be Att. 9.

41. FTD's for smoke detector activation and heat detector activation times are not included on CD.

42. Task 2.5.1 on page F-25 should clearly state what is the "immediate vicinity" and "near fire source" means.

43. Task 2.8 & 2.9 should be excluded from Phase 2. The modified CCDP developed from Task 2.5.3 should be used to support the final screening of Phase 2.

    If this comment is not adopted, Task 2.8.1, Event Worksheet Selection, should also consider the possibility that a "special initiator" (Loss of IA, Loss of CCW, Loss of SWS) is possible and may need to be solved.

    Also, if this comment is not adopted, Task 2.8.2 needs to address what procedures can be credited (EOPs, AOPs, etc.) and if so, how to address the isolation of the RCS PORV to preclude spurious operation in the fire safe shutdown procedure but, once thru cooling in the EOPs will require the un-isolation of that same valve to be able to accomplish this function.

44. Task 2.8.5, Special Cases (pg F-45) discusses findings against post-fire SSD programs which says Phase 2 only applies to a specific fire area. For plant -wide consequences, a Phase 3 should be done. Does this mean skip Phase 2 SDP once the finding is identified in several fire areas? Also, does this mean we should explore each SSD finding to see if it applies to other FAs which really means should we expand the scope of the inspection to accomplish this?

45. Many typos and grammatical errors. This needs thorough editorial review.

46. The purpose of step 1.4 doesn't make sense. There is either an error or the step was made much more complicated and difficult for the LIMITED screening benefit this should provide. This should be significantly shortened (we believe this can be accomplished) and simplified.

    If you analyze the range of all possible solutions for Task 1.4.3, even under the best circumstances (<3 days, DF = 0.0), only one of the 5 categories will ever screen to GREEN. For findings of moderate degradation in the "Fire Prevention and Administrative Controls" category with a generic fire frequency of E-3, single room findings will screen GREEN. Only 6 of 14 generic fire areas have a frequency in the E-3 range. And if the finding applies plant-wide (as is possible in this category) it will not likely screen GREEN for those 6 areas. All other conditions, degradations, and findings categories will always screen in, not out.

    This step needs to be re-examined and revised.

47. New App. F remains very complex. It will take significant training and experience to develop any measurable proficiency to allow routine use. Even then, its complexity will prohibit use on site during the inspection.

48. Many inputs to SDP are not routinely collected during the inspection. Those that are collected are likely to be spread among different team members, each having a piece. A Checklist of information that will be required to successfully process a finding through the SDP should be developed to assist in the collection of the information during the inspection. Each region could do their own, or may even have an unofficial guideline, but it would be better if the checklist was developed with the SDP to ensure nothing was missed and that all 4 regions were working off the same list, for consistency.

49. We need a set phrase to describe the performance deficiency or finding when one Fire Area has multiple issues. Can we come up with a common, accepted set of words that captures this condition for all four regions to use? (E.g., failure to properly implement the fire protection program as required by Operating Licensing Condition 3.L)

50. Overall, this draft SDP is far too lengthy and complex. Additional resource allocations to the baseline are needed to perform the inspection/SDP. Presently, it takes far longer to evaluate one finding than to accomplish the entire inspection by the team. This new process is just as cumbersome and resource intensive. This needs to change and another SDP framework established that is less CDF based and more barrier based. We know generally the most risk significant compartments. Use this to basis (increase by a color) any findings in these compartments. For the barriers we have: Admin. Controls, Detection/Suppression, Fire Brigade, Barriers (wraps, walls, separation), SSD strategy. At a minimum, a realistic estimate of how long (resources needed in FTE) it will take to perform a Phase 2 SDP on current inspection findings that need SDP evaluation needs to be determined and added to the resource allocations.

Mail Envelope Properties (408E674E.8BD : 20 : 51263)

Subject:	Fwd: RII response to DAFFY 04-045E
Creation Date:	4/27/04 9:59AM
From:	Charles R. Ogle
Created By:	CRO@nrc.gov

Recipients	**Action**	**Date & Time**
nrc.gov		
ATL_PO.ATL_DO	Delivered	04/27/04 09:59AM
DCP (Charlie Payne)	Opened	04/27/04 11:31AM
GRW (Gerald Wiseman)	Opened	04/27/04 10:17AM
KFO (Kathleen O'Donohue)	Opened	04/27/04 10:44AM
RPS (Robert Schin)	Opened	04/27/04 11:45AM
WGR1 (Walt Rogers)	Opened	04/27/04 03:42PM

Post Office	**Delivered**	**Route**
ATL_PO.ATL_DO	04/27/04 09:59AM	nrc.gov

Files	**Size**	**Date & Time**
Mail		
MESSAGE	608	04/27/04 09:59AM

Options

Auto Delete:	No
Expiration Date:	5/7/04
Notify Recipients:	Yes
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard
To Be Delivered:	Immediate
Status Tracking:	Delivered & Opened