April 11, 2012

MEMORANDUM TO: Donnie Harrison, Chief
PRA Licensing Branch
Division of Risk Assessment
Office of Nuclear Reactor Regulation

FROM: J.S. Hyslop, Senior Reliability and Risk Engineer ***/RA/***
PRA Licensing Branch
Division of Risk Assessment
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE MARCH 21, 2012, CATEGORY 2 PUBLIC MEETING REGARDING TRANSIENT AND HOT WORK FIRE FREQUENCY ASSOCIATED WITH TRANSITION OF NON-PILOT LICENSEES TO NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 805

On March 21, 2012, the U.S. Nuclear Regulatory Commission (NRC) PRA Licensing Branch held a public meeting related to National Fire Protection Association (NFPA) Standard 805 on transient and hot work fire frequencies and associated influence factors. The purpose of the meeting was to discuss the proper use of influence factors for transient and hot work fires so as to properly assign physical analysis unit (PAU) fire frequencies. A description of influence factors and their rating levels are provided in NUREG/CR-6850 Volume 2, Table 6-3, "Description of Transient Fire Influence Factors."

To begin the meeting, NRC led the discussion on the intent of NUREG/CR-6850 and its view of the proper use of influence factors. Three handouts were distributed during the public meeting to describe those points. The first handout discussed talking points for transient and hot work fire frequencies and the use of associated influence factors. This handout indicated that the intent of the NUREG/CR-6850 methodology on transient and hot work fires is to allow significant adjustments in the partitioning of plant wide transient and hot work fire frequency to specific locations, including a reduction in fire frequency for locations with the strictest access and activity limits and controls. To attain this latitude, the most common rating of an influence factor is "3", with the full range of ratings, i.e., "1" as a minimum (or even "0" in special cases) and "10"

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as a maximum ("50" for maintenance). NRC also noted that the influence factor rating levels within each bin location are to be assessed solely against that bin. As discussed, NRC would expect a range of values to be applied to each bin location whether it's the bin for the Control/Auxiliary/Reactor Building (CAR) or the Turbine Building (TB) bin. Yet, the rating levels for the individual influence factors for the CAR bin would not be compared against the TB bin. An attached simplified example exercising the influence factors, and applying factors leading to core damage frequency (CDF) for transient combustible fires was discussed next. In these examples the fire frequency for the room with least maintenance, storage, and occupancy was not very sensitive to the overall assignment of influence factor ratings. A range of CDFs for a transient fire frequency were developed due to credit for an area factor and manual suppression. Although not discussed, credit for a fixed suppression system may be applicable, though not demonstrated in this example. NRC made the point that a room with low maintenance, storage, and occupancy, as some cable spreading rooms (CSRs) may be, with no fixed sources and redundant trains may be a significant contributor to risk.

Finally, attached graphs from a detailed plant example were discussed that demonstrated several insights. First of all, crediting the resolved Unreviewed Analysis Method (UAM) on hot work induced cable fires significantly reduced the contribution of hot work cable fires to the overall transient and hot work fire frequency. Secondly, the sensitivity studies on hot work and transient influence factors for the detailed plant example demonstrated that a larger reduction in transient frequency can be achieved with the sensitivity studies than demonstrated in the simplified example. Finally, NRC indicated that sample credit for non-suppression probability and area factor enables it to duplicate the credit assigned by applying an alternate factor, suggesting that in this example there may be no need for a deviation from NUREG/CR-6850.

However, industry pointed out that credit for manual suppression or area factor cannot generally be applied in CSRs, for example, due to constraints of certain plant configurations. In fact, it was the experience of one attendee that many rooms would prevent this credit. So it may be inappropriate to generalize the point suggested by the NRC detailed plant example.[1]

Industry also pointed out that, in their view, the discussion should focus on fire frequency, rather than the set of factors leading to CDF for transient and hot work fires. In this vein, industry claimed that the influence factors do not give large enough variation across physical analysis units in a plant. One particular issue of interest to industry is the credit for administrative controls. Although NUREG/CR-6850 allows the highest rating of 50-10-10 and the lowest of 1-0-0, i.e., a factor of 70 difference, this range in their view is not enough to provide the necessary latitude. Industry indicated that even two orders of magnitude would not be enough of a variation across PAUs to account for the full range of frequency.

[1] It was recognized by the author that fixed suppression systems were not discussed; however, their credit would significantly contribute to offsetting the arbitrary factor applied in the plant example, and would be more generic for cases of CSRs with redundant trains.

Different levels of credit for administrative controls were discussed. It was proposed by a participant that a rating level of 0 could be used for an administrative prohibition if there was no plant history of violations or transgressions against this prohibition. NRC pointed out that inspectors find transient combustibles in those areas characterized by strict combustible controls. NRC also raised the issue that generic industry experience might be applicable to other plants; thus, findings against strict combustible controls in one plant could very well be applicable in general to plants. NRC indicated that there are variations in types of administrative controls, some being more restrictive than others. NRC indicated that inaccessibility of a room may be grounds for a rating level of 0 for the maintenance, storage, and occupancy influence factors. The group did not choose at this time to pursue a discussion of what constitutes an inaccessible area.

With respect to the use of rating levels of 0, one member of industry indicated that we should be focusing on transient fires, not combustibles, when identifying if violations are important. The NRC does not agree with this focus since a certain amount of combustibles become fires, and there is no estimate for the probability of transient fires given combustibles.

Industry clarified that they prefer rating levels consisting of fractions less than 1 rather than a 0. Their view is that an administrative control warrants a rating level less than 1, yet accounts for the potential to violate this control. One industry participant questioned why a fraction would be considered an important deviation from 6850 when a lower value, 0, was already acceptable.

Another industry representative indicated that they are already achieving the needed range in influence factors through applying fractional values for the rating levels, and questioned the need to apply a different set of rating levels to expand the range. He didn't see this as a safety issue. NRC responded that the need existed to standardize the NUREG/CR-6850 methodology for current and future use. Also, allowing the use of fractions with the current NUREG/CR-6850 integers while still permitting 10's or 50's would provide a larger range than intended in the methodology.

No conclusions were reached on allowing deviations from the rating levels of influence factors cited in NUREG/CR-6850.

One final issue was raised about the allocation of transient and hot work fire frequency. For a large versus small room with concentrated significant cables with the same footprint, the larger room will have a smaller effective frequency due to the area factor. This issue was tabled and it was agreed that it will not be addressed as a part of this activity.

Several next steps were identified by industry and NRC. Industry will provide examples of rooms/PAUs for which they feel additional leeway is needed beyond NUREG/CR-6850. This will give NRC a better understanding of the different applications. NRC indicated that it wants to see industry's analysis demonstrating that this leeway is necessary as well. NRC will elaborate in writing on the intent of NUREG/CR-6850. It agrees that further clarification is needed and will be helpful for users. No schedule was developed for these items, but NRC and NEI would be in touch to determine the schedule.

A list of meeting attendees is enclosed with this memorandum.

Enclosures:
As stated

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Enclosures:

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DATE	04/11/12	04/11/12	

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PUBLIC MEETING ON TRANSIENT AND HOT WORK FIRE FREQUENCY ASSOCIATED WITH TRANSITION OF NON-PILOT LICENSEES TO NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 805
LIST OF ATTENDEES

March 21, 2012

U. S. Nuclear Regulatory Commission Staff	**Stakeholders**
R. Gallucci	B. Bertucio (Scientech)
S. Dinsmore	V. Anderson (NEI)
F. Gonzalez	K. Zee (ERIN)
J. Evans	G. Zucal (ERIN)
J. Patel	B. Van Sant (OPPD)*
J.S. Hyslop	D. Lippy (OPPD)*
N. Melly*	B. Downy (SCE)*
R. Langstaff (Region III)*	C. Worrell (Westinghouse)*
H. Peterson (Region III)*	L. Bedell (Entergy)*
T. Olivier (SNL)*	D. Miller (Entergy)*
S. Nowlen (SNL)*	S. Weimer (Entergy)*
S. Short (PNNL)*	J. Stone (CENG)*
	J. Hiller (Ameren)*
	J. Julius (Scientech)*
	A. Young (Scientech)*

* participated via phone

ENCLOSURE