RulemakingComments Resource

From: George Vayssier [glvayssier@cs.com]
Sent: Thursday, February 21, 2013 4:30 PM
To: RulemakingComments Resource
Cc: Beall, Robert
Subject: Comments Docket ID NRC–2012-0031, re Emergency Response rulemaking
Attachments: Comments on the Proposed Rulemaking Regarding Emergency Response.rev1.doc

Dear sir / madame,

please find attached my comments to the proposed rulemaking on the Emergency Response, following recommendation 8 of the NTTF.

Sincerely,
George Vayssier,
NSC Netherlands, director

PS. Mr. Beall, for your info. Please check whether the email was delivered to the proper place inside NRC.

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D510

Comments on the Proposed Rulemaking Regarding Emergency Response Capabilities

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1. Introduction

I believe the initiative for this rulemaking is extremely important and is a major step forward. Not only for the US, but also for the many countries that base their approaches on the US regulation.

2. Observations.

Four options are described, each of which is valuable contribution. Yet, I would like to make the following observations:

2.1 The basic rulemaking stays with design basis accidents, and is the departing point for rulemaking beyond. I guess a more fundamental change is warranted, in that the accidents beyond the (traditional) design basis are taken up in the regulatory framework. I say 'traditional', because more modern designs, such as the Westinghouse AP1000 and the GE Hitachi ESBWR consider core damage accidents already fully inside the design basis. This had already been done in the IAEA Safety Requirements SSR 2/1, where accident beyond the (traditional) design basis are now formulated as 'Design Extension Conditions', and requirements are specified for those conditions. Such conditions are also proposed in the Proposed Rulemaking by USNRC Commissioner George Apostolakis in the form of 'Design Enhancement Categories'. Hence, I would propose to integrate the envisaged rulemaking into the new risk-informed performance-based rulemaking (assuming the NRC will adopt the proposal by Commissioner Apostolakis). Note: as the time frame for the development of the Apostolakis approach – if decided to be followed - may be long, those parts that serve this effort could be pre-treated.

2.2 Placing the systems and procedures to mitigate severe accidents under the regulatory umbrella has also the advantage that those systems are candidates for safety system classification (albeit on a more modest scale as the traditional safety systems, such as ECCS). The IAEA has done this in its (draft) Safety Guide for systems classification, DS 367. Generally, the traditional safety systems are classified as safety class 2, whereas those systems intended to mitigate severe accidents are generally classified as safety class 3. The NRC rulemaking proposal does not address classification of those systems. In many SAMG approaches, no qualification requirements are specified for equipment that is used in severe accident mitigation. This is a severe deficiency; it is a heritage from the traditional design basis accident thinking. Note: new designs consider this.

2.3 I do not support the fear, expressed in the report (sec. 4.1, second paragraph), that placing too much attention on severe accidents will dilute the operator capability and responsibility to work with the EOPs. Severe accidents are only *calculated* to have an extremely low probability of occurrence, whereas we have seen actual severe accidents (TMI, Chernobyl, Fukushima-Daiichi) as well as precursors (e.g., the Browns Ferry fire, the Maanshan station black-out, various others). The cause for this discrepancy in calculations and observations is probably due to the virtually infinite number of possibilities for human error, as well as the unpredictability of external events, and nature and scale of terrorist attacks. Therefore, some form of training of operators in SAMG, EDMG, etc. is vital, and does not dilute his work with EOPs. Due to the complexity of severe accidents, support by the TSC will be needed. In other words, operators need to consider low-probability high-consequence events: they *must* make a step forward from their EOPs. In still other words, the new procedures (SAMG, EDMG, FLEX) have similar weight as the EOPs, but the responsibility may be shared by other parts of the licensee organisation or even external organisations. To keep the focus on EOPs, as stated in sec. 4.1, is - therefore - not correct.

2.4 Regulators *cannot* and *should not* define what is inside EOPs, SAMG, EDMG, FLEX. That is industry capability and responsibility. Therefore, the only workable option is to let the industry develop appropriate standards, that define the minimum acceptable and the best achievable approach. I would compare this to the mechanical and electrical standards, such as the ASME Boiler and Pressure Vessel Code (BPVC) and the standards by the ANS, the IEEE and the IEC. The standards should include methods to test the capability and maintenance of the standards as they are implemented (such as ASME XI for pressure vessels).
Regulators can then endorse those standards and verify that work is executed in conformance with the standards. Voluntary industry initiatives that do not lead to regulator involvement are subject to failure. The SAMG initiative of 1994 (NEI 91-04, rev.1) has led to a wide scatter of approaches, with sometimes bad maintenance and bad training. The industry has proven that this approach does not work. Hence: development and inspection of EOP, SAMG, EDMG and FLEX by industry in the form of standards, and then endorsement of those standards by the NRC, plus inspection by the NRC whether the work is done properly. As a minimum, NRC inspection of SAMG, EDMG, FLEX should be of the same level and rigour that presently is applied for the EOPs. The inspection should also include the appropriateness and suitability of procedures and guidelines to obtain the desired response. Note: this will also be an extension of the present level of inspection of EOPs.
Note: where development of standards is a long process, the initiation can be with NEI, EPRI or other broadly based industry documents, possibly also with IAEA documents.

2.5 A well-defined basis for SAMG is in the IAEA Safety Guide for severe accident management, NS-G-2.15. This guideline is at present under revision to include lessons from the Fukushima-Daiichi accident. It covers all subjects: the development of the procedures and guidelines, the organisational aspects, the training and exercises, and the processing of new information (from research and plant operating experience). In the revision attention is given to response to extensive damage on the site (restore command and control, use of portable equipment, multi-unit aspects and off-site support).

2.6 The IAEA has also developed a comprehensive inspection tool to verify the adequacy of the SAMG program at a particular NPP. This is documented in the IAEA Services Series No. 9, 'Guidelines for the Review of Accident Management Programmes in Nuclear Power Plants', also known as the IAEA RAMP Service (RAMP = Review of Accident Management Programs). This Guideline is also under revision to reflect the changes in NS-G-2.15.

2.7 The present industry approach in SAMG shows a wide scatter in approaches. Not only in technical detail, but also in basic principles and philosophies. Some place all emphasis on core cooling, others on integrity of fission product boundaries. For example, there is a good contact between the Owners Groups of the US PWRs, but the BWR Owners Group hardly takes part in the PWR-work where harmonisation is the main subject. European efforts are even further away from the US efforts - another reason to develop industry standards. Because such standards can be adhered to worldwide: they are no product of a specific regulatory environment. Note: in the NEI-response, reference is made to the EPRI Technical Basis Report (just revised), but this report is phenomena-driven and does not describe how SAMG should be developed. The wide scatter of present day approaches is the result. I tend also to disagree with the NEI statement that the BWRs are so different from the PWRs that no common SAMG can be developed. The goal is not a common SAMG, but common *principles*, such as priority for protection of fission product boundaries, attention for the chronology and severity of the fission product boundary challenges. Even in these basic principles present SAMG approaches differ widely. I believe it is a major achievement in the IAEA NS-G-2.15 that these basic principles are described in a coherent and consistent way.

2.8 At the IAEA, an extensive effort is underway to address the effect of external events (seismic, tsunamis, flooding, extreme weather, human actions). For this purpose, the International Seismic Safety Centre (ISSC) has been erected. It is recommended to take note of these efforts and process relevant insights.

3. Conclusions

The only viable option for this extreme complex matter of preventing and mitigating severe accidents is a series of industry standards, covering the EOPs, SAMG, EDMG and FLEX, both in their technical content as well as in their interfaces and interaction. A suitable first step is the IAEA Safety Guide NS-G-2.15, revised. The work should be interfaced with the upcoming risk-informed performance-based framework, proposed by Commissioner Apostolakis, notably where to address the 'Design Enhancement Category'. A first step could be to include the Design Extension Conditions', as described in IAEA Requirements SSR 2/1.

NRC should then develop regulation which requires implementation of these standards, and develop an inspection process to verify implementation. Note that the industry standards themselves also cover the matter of inspection; hence, the NRC inspection can ultimately be a verification of the industry inspection. Such industry inspections can be carried out by peers, WANO, others. Use can also be made of the IAEA RAMP inspection method, as discussed above.

At present, there are no industry standards for SAMG, etc., and it may take long time to develop those. Ad interim, the NRC could develop rulemaking to fill that gap. This, however, is only a temporary option. I assume that proper pressure on the industry to develop the standards will make up for this problem.

The above proposal goes beyond what is proposed by the NRC, in terms of the Options 1 - 4. Closest is Option 4, in my view, although Option 1 would also do.