

Original Due Date: 09/02/2005

Ticket Number: 020050176

Document Date: 08/19/2005

NRR Received Date: 08/19/2005

**From:**

BDLiaw

**TACs:**

MC8129

**To:**

Brian Sheron

**\*\*\* YELLOW \*\*\***

**For Signature of:**

**Routing:**

Dyer  
Borchardt  
Sheron  
NRR Mailroom

**Description:**

Regulatory Issue Summary 2005-17

**Assigned To:**

DE

**Contact:**

MAYFIELD, MICHAEL E

**Special Instructions:**

**From:** <Bdliaw@aol.com>  
**To:** <RWB1@nrc.gov>  
**Date:** 8/19/05 10:06AM  
**Subject:** Regulatory Issue Summary 2005-17

Dear Bill:

I have read the recently published RIS 17 regarding the N-symbol requirements for ASME Classes 2&3 equipment. Are you aware of how the issue gets surfaced? It came from Taipower!

Please take a look at it. I think the staff is wrong on the reasoning. It basically said that "...we screwed-up, but we forget to change the RG1.26 when we went thru rulemaking on 10CFR50.55a to "require" all safety related equipment be N-stamped regardless of the Code Class...." You know this is inconsistent with the past staff practice as well as the bases for reviewing the certified standard designs. There is a footnote b, which said explicitly that N-stamp is NOT required for Quality Groups B & C equipment, which corresponds to ASME Code Classes 2&3. By saying that we should have removed the footnote note, or to say that we eventually will remove the footnote, therefore, all future plants should have all SR equipment, regardless its Quality Group classification, N-stamped is a BIG BACKFIT!

For details, I am attaching a copy of memo I wrote to Taipower for your information. With respect to the issue resolution at the Lungmen job site, it is irrelevant now. But, I am informing you before American utilities or NEI raise hell with NRC.

I will please to talk to you further if you can make it.

With Best Regards,

BDLiaw

**MEMORANDUM FOR: T.M. Liang, Director**  
**Department of Nuclear Engineering**  
**Taiwan Power Company**

**FROM: B. D. Liaw**  
**Managing Director - Energy**  
**Dynamic Resolutions, LLC**

**SUBJECT: N-STAMPING ISSUE FOR ASME III CLASS 2&3**  
**EQUIPMENT**

In January, 2005, trip to Taiwan Power Company (TPC, or the Company), the author was requested to review the background information including all correspondences between the Company and its NPP#4 Nuclear Island contractor, the GE Nuclear (GENE); to consult with the NRC staff on the NRC approach to the subject issue; and to provide an opinion on the resolution of the issue. Upon returning to U.S., the author started to review the information provided by DNE. On January 27, 2005, the preliminary results were conveyed to the DNE management (T. M. Liang and M. L. Ho) by two E-mails. Subsequent to this preliminary review, the author contacted the NRC/NRR cognizant staff to briefly explore the NRC position on the N-stamping "requirement" for ASME Section III Class 2&3 equipment. A face-to-face meeting was scheduled for February 9, 2005. In the meeting, the NRC staff agreed that the regulations (10CFR50.55a(d) and (e)) as presently worded and structured are confusing, and are subjected to different interpretations. A Regulatory Issue Summary (RIS) is, perhaps, needed to clarify the issue. A telephone conversation was again made to discuss the ABWR/SSAR and the NRC staff Safety Evaluation Report (SER), and whether a certified design itself carries an equal weight as a regulation in the legal sense.

On February 16, 2005, the results of discussions with the NRC staff (D. Terao and P. Serack of NRR, Division of Engineering) was summarized and conveyed to both DNE and DNS management of the Company. By then, the issue became more clear that the Regulatory Guide 1.26 was the NRC staff's criteria for reviewing all Structures, Systems, and Components (SSCs) for Quality Group Classification under Standard Review Plan Section 3.2.2. This was further confirmed by the staff SER on ABWR/SSAR (NUREG-1503, Section 3.2.2 System Quality Group Classification.)

On March 4, 2005, a presentation was made to the Company staff from various organization components; i.e., DNE, DNS, LCO, QA, Site SEO and the Quality Assurance Task Group. The presentation materials are attached as part of this report.

## **ISSUE DEFINITION**

On June 4, 2004, the Company's QA issued two Non-Conformance Reports (NCRs) against 78AHUs and 12 chillers procured by GE/B&V and supplied by Ellis Walt Internation/Aerofin. The basis of both NCRs was that these equipment were designed to ASME Section III and "should have been N-stamped."

In an internal audit by B&V QA, NCRs were also issued for the same reason. However, the NCRs were disposed of by invoking Regulatory Guide 1.26, footnote b which indicated that N-stamp was not required for Quality Group B and C equipment designed to ASME Section III, Class 2&3 rules, respectively.

From documented evidence including correspondences between the Company and GENE, one can clearly see that GE/B&V has totally mishandled the issue in response to two

NCRs, issued by TPC/QA. First, GE/B&V admitted to the non-conformance condition; hired ASME Code experts to assess the situation; then, proposed four options, from in-situ refurbishment to total replacement. GE then made an inquiry to the ASME Code Committee whether the Code required "N-stamp" for Class 2&3 equipment and whether the Code can provide N-stamps; then, claimed Code rules were not available to the type of design/fabrication, therefore, it was "unethical" to do otherwise. Finally, by letter dated, October 22, 2004, GE proposed the disposition to "use-as-is." It is judged by the author that GE was misguided to believe that it was a Code compliance issue, rather than a licensing issue and/or a contract dispute.

After a series of back-and-forth exchanges by letters, the Company faces a dilemma: A general perception that these equipment need to have N-stamped and that the Company had "committed" to the regulatory authority the same made it not prudent to accept GE's proposal for the disposition of these NCRs to "use-as-is." On the other hand, there is nothing wrong with these equipment, having already been shipped on site, and a rejection and replacement may take time that could severely impact the construction schedule.

## **PRACTICE IN U.S.**

An inquiry to the NRC staff and some discussions with some U.S. utilities revealed that about half of the 103 operating nuclear units were not designed to ASME Code Section III, therefore, the N-stamping issue had never existed. The remaining half of the 103 operating units in U.S. had invoked the Regulatory Guide 1.26 that "exempted" the Code requirement of the N-stamping for Class 2&3 equipment with possibly a few exceptions in the Code states like Texas and Tennessee before the Congress preempted state authority to promulgate requirements for nuclear plants. The Bechtel standard plants under the SNUPP Project may also have these Class 2&3 equipment N-stamped, because Bechtel was the A/E for TPC's Nuclear Stations 2&3, where Bechtel advised TPC to have these equipment N-stamped. It would be interesting to find out whether these SNUPP plants, Callaway and Wolf Creek, indeed have these equipment N-stamped.

Again back to the practice in U.S., all four certified standard designs; namely, ABWR, CE System 80+, AP-600 and AP-1000, were reviewed and "licensed" using Regulatory Guide 1.26 as the principal acceptance criteria, as evidenced by the NRC staff SER on ABWR/SSAR, NUREG-1053, Section 3.2.2. In another words, these certified designs were docketed after May 14, 1984, and were licensed without N-stamping for their Quality Group B and C equipment designed to ASME III Class 2&3 rules, respectively.

As an example, the Calvert Cliff plant of Constellation Energy was not designed to ASME Section III, except one system that was a backfit as part of the post-TMI requirements. Yet, this plant was one of the very first to have its license extended to 60 years.

## **RELATIONSHIPS BETWEEN REGULATIONS, CODE, OWNER AND CONTRACTOR**

As the owner, entrusted by its financial backers, decides to build a nuclear plant, he will select a design and make an application to the regulatory authority for a Construction Permit (CP). In the application, the owner and the regulator will have to agree to the standard or Code to which the plant will be designed for all plant's SSCs. In this process, the Code is really a third party by-stander. The Code requirements become applicable only if the owner invokes it and the regulator accepts it. Code requirements such as the use of ANI or N-stamping become applicable if the owner or the insurance company demands them as an additional protection of their investment. Both the owner and the regulator can take exceptions to Code rules / requirements.

A few words about the nature of the Code Committee can enhance the understanding of the issue: It is a professional association of technical "experts" representing various interest groups and stakeholders; i.e., academic institutions, vendors, A/Es, and even the government / regulators. The participants are really representatives of these various institutions, yet they participate in Code/Standard setting activities as "individuals." For example, the NRC staff's participations are sanctioned by the agency, were allowed time off on official business and expenses paid by the agency. Yet, they do not represent the agency in the legal sense. However, if the Code Committee passes certain rules they do not feel appropriate, they come back to the agency and recommend that these rules not be endorsed. 10CFR50.55a regulations are the mechanism to interact with the various professional Code making bodies.

10CFR50.55a is different from most parts of the regulations: Some portions were approved by the Director of the Office of the Federal Register to be incorporated by reference, some are not. Furthermore, this paragraph of the regulations cites a number of Regulatory Guides to "approve" or to take exceptions to Code rules. For example, R.G.1.26 on Quality Group Classification, R.G. 1.147 on In-service Inspections under ASME X1, R.G. 1.84 on Code Cases, and R.G. 1.192 on ASME O&M Code.

From a practical perspective, the Code Committee's prestige will be greatly enhanced if more of its rules are adopted / endorsed by the owners and the regulators. With respect to the use of ANI, their job security will also be enhanced if more insurance companies and owners / regulators demand their service, and the N-stamping.

Coming to actual building of the plant, the owner hires a contractor to design it and to provide equipment necessary for the task. Here, a distinction needs to be made between two prevailing forms of contracts; i.e., "fixed price" and "cost plus" contracts. In a fixed price contract, either for design work or equipment supplies, the contractors tend to find ways to reduce their cost in order to maximize their profits. In a "cost plus" contract, there are no incentives, in general, for the designers or equipment suppliers to save money for the owner. This help explain, at least partially, why NPP# 2 and #3 were advised by the A/E to have all ASME III equipment N-stamped when there were explicit language in the regulations that N-stamping could be exempted.

## REGULATORY ANALYSIS

In U.S., the regulatory authority endorsed ASME Code Section III as the principal design standards for most SSCs in a nuclear plant. This does not mean that ASME Section III is the only acceptable Code for the purpose. The regulations also provide method by which the owner can build a nuclear plant to standards other than the ASME Section III. Theoretically speaking, a utility in U.S. can build a plant to the French Code, as long as he can demonstrate the "equivalencies" in quality and the level of safety.

For ASME Section III plants, the Quality Group A SSCs must meet the ASME Section III design rules for Class 1 components including N-stamping (10CFR50.55a (c)). There are no provisions to allow exceptions unless explicitly approved by the NRC, following 10CFR50.55a(a)(3) (i) and (ii).

For Quality Group B and C SSCs, the explicit language said that, for applications, docketed after May 14, 1984, these SSCs must be designed to code rules for Class 2&3 components, respectively, which can be interpreted to include N-stamping. However, a footnote 9 on the Quality Group B and C SSCs indicates that regulatory Guide 1.26 may be used to meet the requirements of this sub-paragraph. As already explained earlier, R.G. 1.26, through footnote b, explicitly stated that N-stamping is not required for these SSCs. This has been the practice for most operating nuclear units in the U.S. designed to ASME Section III, as well as four certified standard designs, even though the applications for these certified designs were docketed after May 14, 1984. In the staff SER on ABWR/SSAR, it was very clear that R.G. 1.26 was the principal criteria by which the NRC staff reviewed and concluded that the design meets the General Design Criterion 1 (GDC 1).

Under 10CFR52, a certified design is codified as the NRC's commitment to future applications referencing that particular design. The NRC staff cannot tighten the requirements without a backfit analysis (which has a very high standard to pass) and only through rulemaking for Tier 1 equipment. For Tier 2 equipment, a 10CFR50.59 – like process can be used to make changes by the owner. Therefore, it is obvious that a certified standard design itself is a “regulation,” i.e., it carries the same weight as other parts of regulations in the legal sense.

## **TPC COMMITMENTS TO ROC/AEC**

Other than possibly some verbal “commitments” made in various occasions, most formal commitments are stated in PSAR, which serves as the basis for the CP when accepted. Unless otherwise specified, the PSAR is essentially the ABWR/SSAR, including R.G.1.26 in the list of applicable regulatory guides and other regulatory instruments issued by the U.S. NRC.

With respect to the N-stamping issue, the Company might have informed the ROC/AEC the intent that can be viewed as a form of “commitments.” However, the TPC staff should persuade in good faith the ROC/AEC staff to accept something less when the situation changes that prevent the Company from honoring the original intended “commitments” if, and only if, the safety and quality are not to be significantly affected.

## **CONTRACT REQUIREMENTS VS. TPC INTENTS**

According to information provided to the author, it is clear that Bid Specifications did require that ASME Section III equipment need N-stamping. GENE never disputes the TPC staff's claim of intent. However, the Contract Section 3.2.8.2.A.2 (1) stated clearly that N-stamping was required only for NSSS equipment. By definition, Auxiliary System equipment like chillers and AHUs are not NSSS equipment. It is not uncommon in the ABWR design that some equipment tasked to perform limited safety functions (e.g., mitigation of severe accidents) were allowed to be less than similar equipment required to perform a full range of safety functions. For example, the steam tunnel structures need to maintain their functionality during severe accidents coupled with a seismic event. The structures were designed to the seismic Category I requirements without being designated as a seismic Category I structures.

Whether TPC's intent was worded in the final Contract with GENE is disputable, at best. Arguments such as:

- NPP # 2 and # 3 had similar equipment N-stamped as a proof of TPC's intent; and
- NRC will drop footnote b in R.G.1.26 anyway

are irrelevant. An “intent” is nothing but a “state-of-mind” that would probably not be accepted in the court of law. In current regulatory environment in U.S., it is highly unlikely that the NRC would be willing to backfit the “requirement” of having Class 2&3 equipment N-stamped which would result if the footnote b in R.G.1.26 is dropped. The fact that nobody will build another custom plant in U.S. (most would go to one of the certified standard designs) makes it even less likely for NRC to change the R.G. 1.26.

## **CONCLUSIONS**

- As experienced in 1970s in U.S., the plant owner can always ask more than the regulators required, like “gold-plated” equipment. When the equipment delivered was found not to be “gold-plated,” the owner may ask for compensation from the equipment

suppliers. Exactly how much the compensation should be is something for the owner and the suppliers to negotiate. Using ordering a car, said a Mercedes Benz, as an example, when the car delivered was shown to be using the same materials, made under the same specifications, and from the same production line, but without the "mark", one could ask how much would it worth with the Mercedes Benz "mark"?

- GENE has clearly been mishandling the issue as evidenced by the fact that they "flip-flop" in a number of correspondences with TPC.
- There appears no regulatory compliance issue involved, as the history of regulatory practice in U.S. as well as the NRC staff SER on ABWR/SSAR indicated. There may be a Code compliance issue, but the Code's role is short-changed by the footnote 9 in 10CFR50.55a(d) and (c)).
- In a certified standard design, details in the design are really parts of requirements that carry the same weight as a regulation.