

# UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

Title: BRIEFING ON PROPOSED RULEMAKING  
ON SUBSTANDARD COMPONENTS

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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BRIEFING ON PROPOSED RULEMAKING ON  
SUBSTANDARD COMPONENTS

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PUBLIC MEETING

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Nuclear Regulatory Commission  
One White Flint North  
Rockville, Maryland

Thursday, February 2, 1989

The Commission met in open session, pursuant  
to notice, at 2:00 p.m., the Honorable LANDO W. ZECH,  
JR., Chairman of the Commission, presiding.

COMMISSIONERS PRESENT:

LANDO W. ZECH, JR., Chairman of the Commission  
THOMAS M. ROBERTS, Member of the Commission  
KENNETH M. CARR, Member of the Commission  
KENNETH C. ROGERS, Member of the Commission  
JAMES R. CURTISS, Member of the Commission

1 STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:  
2 JOHN HOYLE, Assistant Secretary  
3 WILLIAM C. PARLER, General Counsel  
4 JAMES TAYLOR, Deputy Executive Director,  
5 Operations  
6 JAMES SNIEZEK, Deputy Office Director, NRR  
7 WILLIAM BRACH, Chief, Vendor Branch  
8 BRIAN GRIMES, Director, Division of Reactor  
9 Inspection and Safeguards  
10 BEN HAYES, Office of Investigations  
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P R O C E E D I N G S

(2:00 p.m.)

CHAIRMAN ZECH: Good afternoon, ladies and gentlemen.

The purpose of the meeting this afternoon is for the NRC staff to brief the Commission on the Advance Notice of Proposed Rulemaking concerning Acceptance of Products Purchased for Use in Nuclear Power Plant Structures, Systems and Components, which the NRC staff recently forwarded to the Commission for approval, in its paper, SECY-89-10.

This Advance Notice of Proposed Rulemaking would solicit public comment addressing whether regulatory actions may be necessary and appropriate to assure that products purchased for use in nuclear power plants will perform the functions necessary to protect the public health and safety.

I would ask that the Commissioners who have not already voted to do so, on this staff paper, after you have reflected from this afternoon's meeting.

The staff last briefed the Commission on December 20th, 1988, concerning the current status of its actions to address the possible use of substandard or counterfeit components in nuclear power plants.

Although the Commission has been informed that

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1 there have been no indications of any specific safety  
2 problem, the NRC will remain prepared to take whatever  
3 action is necessary to assure the safety of nuclear  
4 power plants.

5 This issue of substandard components is a very  
6 serious one, and one that this Commission has given high  
7 priority. The Nuclear Regulatory Commission technical  
8 staff, in close cooperation with the Office of  
9 Investigations, is aggressively pursuing this matter.

10 In addition, I understand that the staff is  
11 continuing to cooperate and coordinate with the Office  
12 of Management and Budget, to assure that information the  
13 NRC develops is disseminated throughout the government  
14 agencies.

15 This meeting is an information briefing this  
16 afternoon. I understand that copies of the slides are  
17 available as you enter the room.

18 Do any of my fellow Commissioners have any  
19 opening comments to make before we begin?

20 (No response.)

21 If not, Mr. Taylor, you may proceed.

22 MR. TAYLOR: Thank you, Mr. Chairman. Before  
23 beginning the details of the briefing, I would like to  
24 note that in parallel with this proposed rulemaking, the  
25 staff is encouraging industry itself to take initiatives

1 to preclude the introduction of substandard or  
2 counterfeit material into the plants.

3 Of course, the industry people have the  
4 experience in purchasing, receiving and testing  
5 products, and they have a pool of expertise, which we  
6 would hope and are encouraging the industry to take that  
7 type of expertise to review the broad areas of  
8 procurement and help to identify components or parts of  
9 the plant which may have a potential, or a higher  
10 potential, for introduction of counterfeit or  
11 substandard parts.

12 We are working with industry also, to examine  
13 other means, such as using national standards  
14 organizations, which might be the basis for helping to  
15 develop standards which may, indeed, contribute to  
16 precluding the introduction of counterfeit materials, by  
17 better standards. And there's quite a bit of long-term  
18 industry experience in the component area, in some of  
19 the standards organizations.

20 So, we're trying to get this type of effort  
21 going by working with the industry representatives, in  
22 addition to our layout that's in the proposed rule. In  
23 parallel, the staff is continuing to pursue its own  
24 initiatives, it's work in the field where we have  
25 information which may lead us to believe that perhaps

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1 counterfeit or substandard material may have been  
2 introduced.

3 I'm pleased that OI is with us -- Mr. Hayes--  
4 this afternoon. He will -- as we talk about it, there  
5 may be one or two circumstances in which we get close to  
6 investigatory material which we should not discuss in  
7 open meetings, and he's here to advise us on that  
8 matter.

9 I should emphasize that the staff is gratified  
10 at the close cooperation that OI has provided with the  
11 technical staff in this entire area. It's a model of  
12 cooperation in a difficult area, and I think it's been  
13 running very well to this point.

14 CHAIRMAN ZECH: I'm glad to hear that.

15 MR. TAYLOR: With those few remarks, I'll turn  
16 the details of the briefing over to Mr. Grimes, who has  
17 some remarks also.

18 CHAIRMAN ZECH: Mr. Grimes, you may proceed.

19 MR. GRIMES: The principal briefing will be  
20 done by Mr. Brach, who is Chief of the Vendor Branch,  
21 but I just wanted to make -- note a couple of things.  
22 First, that, as you know, this Advance Notice of  
23 Proposed Rulemaking came out of a number of specific  
24 concerns on specific component types over the past  
25 couple of years and, over the last year, our concern has

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1 expanded from fasteners to include molded-case circuit  
2 breakers, ASME flanges and fittings and some other types  
3 of components.

4 The Commission, as you noted, Mr. Chairman,  
5 has been briefed on these matters before, and has  
6 strongly supported the inspection and investigative  
7 efforts in this area, and has also kept our Oversight  
8 Committees informed of the NRC's intent to vigorously  
9 pursue these areas.

10 This Advance Notice of Proposed Rulemaking is  
11 intended to explore the need for further specific  
12 regulatory requirements -- specifically, regulations in  
13 this area -- and it's also intended to let industry know  
14 in some detail exactly what our concerns are in these  
15 various areas.

16 Now, with that, I'll turn it over to Mr. Brach  
17 to go through the content of the briefing.

18 CHAIRMAN ZECH: Thank you very much. You may  
19 proceed.

20 MR. BRACH: If I could have slide number 2,  
21 please.

22 (Slide)

23 As the Commission may recall, at staff  
24 briefings to the Commission on the status of our  
25 inspections and investigations involving counterfeit and

1 fraudulent vendor products, we identified to the  
2 Commission both in July and most recently in December,  
3 concerns that the staff were identifying in the -- I'll  
4 say deficiencies or inability of the Appendix B quality  
5 assurance program, to assure detection of instances of  
6 apparent counterfeit and fraudulently marketed products.

7 As noted on the briefing charts, Appendix B  
8 has principally been designed to detect substandard and  
9 poor quality or out-of-specification products. It has  
10 not necessarily been designed to detect the intentional  
11 falsification or counterfeit or fraudulent marketing of  
12 vendor products.

13 The basis of the ANPR that's before the  
14 Commission right now is focusing on methods that are--  
15 addressing questions which would focus on methods that  
16 the NRC may pursue, to put in place to assist in the  
17 ability to detect instances of counterfeit and  
18 fraudulent materials.

19 Slide number three, please.

20 (Slide)

21 The focus of the Advance Notice of Proposed  
22 Rulemaking is principally in the area of procurement  
23 options, or procurement programs. We are focusing on  
24 two particular areas, the procurement of safety-related  
25 products from approved vendors -- vendors who are

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1 implementing, currently implementing, quality assurance  
2 programs in conformance with 10 CFR Appendix B, and a  
3 second option -- licensee procurement of commercial  
4 grade items from the open market, and the licensee  
5 subjecting those products to their own dedication and  
6 acceptance testing for qualification for safety-related  
7 application.

8 Those are the two principal areas that are the  
9 focus of the ANPR. And there have been earlier  
10 questions that have been raised to us with regard to  
11 the, if you will, the percentages of licensee  
12 procurements of safety-related items versus commercial  
13 grade items for dedication purposes.

14 As we mentioned to the Commission at the  
15 December briefing that, based on inspections, we are  
16 seeing more and more instances of licensee procurement  
17 of commercial grade items where the licensees have  
18 subjected those items to the dedication programs and  
19 safety-related application themselves, as contrasted to  
20 what was previously -- say, five or ten years ago -- a  
21 higher percentage of safety-related procurements from  
22 vendors who were manufacturing under approved quality  
23 assurance programs.

24 There, of course, are a couple of obvious  
25 reasons for that. One, of course, would be cost, I

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1 would assume but, secondly, more -- there are fewer and  
2 fewer vendors available today to the nuclear grade or  
3 safety-related application market, and the licensees, in  
4 some regards, have been forced, to some extent, to the  
5 buying of commercial grade products and subjecting those  
6 to their -- for their own dedication programs.

7 As I noted, the ANPR is focusing on the two  
8 aspects of procurement involving safety-related and  
9 those commercial grade procurements for dedication  
10 purposes.

11 If I could have slide number 4, please.

12 (Slide)

13 The current issues and problems we have  
14 discussed and the Chairman summarized as well in his  
15 opening remarks. We have seen more and more instances  
16 of apparent counterfeit and fraudulent practices by the  
17 part of vendors, in providing equipment to nuclear power  
18 plants, and this, of course, has heightened the concern  
19 on the part of both the Commission and staff management,  
20 as to the possibility of that counterfeit equipment  
21 being entered into safety-related applications and,  
22 thus, causing concerns with regard to continued safe  
23 operation.

24 As noted, we have identified more and more  
25 instances. Mr. Grimes had mentioned, these run the

1 gamut from the instances that initiated with fasteners,  
2 involving nuts, bolts and screws, to piping material,  
3 fittings and flanges, molded-case circuit breakers,  
4 which have been a fairly extensive effort on the part of  
5 NRC in reviewing the market for molded-case circuit  
6 breakers to nuclear power plants. Other issues involve  
7 valves, valve replacement parts and, in other examples,  
8 piping materials.

9 Based on NRC inspections and reviews of  
10 licensees and vendor facilities, we've identified a  
11 number of problems in both the procurement programs and  
12 the dedication programs. And so, again, the focus of  
13 the ANPR is an attempt on our part to address public  
14 comment to those areas involving procurement and  
15 dedication programs that may be an assist to the NRC in  
16 having a tighter regulatory control over these two  
17 aspects.

18 CHAIRMAN ZECH: And focuses on counterfeit and  
19 substandard components, is that right? In other words,  
20 you said our current regulations, on your slide 2, are  
21 not designed to detect counterfeit and fraudulently  
22 marketed products. Is this ANPR designed to address  
23 that issue?

24 MR. BRACH: That is correct. I'll address it  
25 a little bit further as we go along, but the answer is

1 yes.

2 CHAIRMAN ZECH: All right. Thank you.

3 MR. BRACH: It is addressed to detect those  
4 types and pieces of equipment.

5 CHAIRMAN ZECH: Fine. You may proceed.

6 MR. BRACH: Slide number 5, please.

7 (Slide)

8 The goal of the ANPR. There are a number of  
9 questions in the ANPR, and they are structured around a  
10 basic set of premises. One involves the increased  
11 engineering involvement in the procurement programs, in  
12 identifying the critical characteristics of equipment  
13 and material that's being procured -- that is, those  
14 critical characteristics that are necessary for the  
15 intended application at the facility.

16 The questions also involve enhanced receipt  
17 inspection and testing to verify, verify on the part of  
18 the licensee, that those critical characteristics that  
19 have been identified have, in fact, been satisfied in  
20 the procurement and receipt inspection and testing  
21 programs.

22 A third area involves the topic of  
23 traceability, traceability of the equipment through  
24 intermediate suppliers, back to the original equipment  
25 manufacturer. It might be summarized in a simplistic

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1 sense of knowing what you are buying and who you are  
2 buying it from, from the standpoint as far as  
3 traceability of equipment with regard to material  
4 composition, engineering design and specifications.

5 A fourth premise, fourth and fifth premise,  
6 involve the concept of improved audits and improved  
7 vendor oversight, as well as considerations of joint  
8 industry programs in both audit and approved vendor list  
9 composition.

10 These basic premises are structured to fit the  
11 three questions that are posed on this briefing slide--  
12 that is, to the public, asking their input and comment  
13 -- are new regulatory requirements necessary in this  
14 area and, if so, what should be included in any such new  
15 requirements, as well as asking the public for any ideas  
16 or options of their own that they may offer to us as  
17 alternative methods for helping us or helping the  
18 nuclear industry, NRC, have a better handle on  
19 controlling the concerns involving counterfeit and  
20 fraudulent materials.

21 We'll note as well that our questions to the  
22 public are phrased in asking for their input as well as  
23 to whether NRC requirements, if any, in this area,  
24 should be of a performance-base nature or prescriptive,  
25 as far as being very specific in the details of various

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1 material compositions or types of testing and sampling  
2 that might be needed.

3 I would note that in the SECY paper that was  
4 forwarded to the Commission, the staff had initially  
5 proposed a comment period of 60 days. As noted, after  
6 further consideration, feel that 120 days is a more  
7 appropriate time period for consideration, to include  
8 the time necessary for standards organizations as well  
9 as more deliberative processes, to give a more valued  
10 input to the NRC in this area. So, the staff is  
11 recommending the 120-day comment period.

12 CHAIRMAN ZECH: Before you go on to the next  
13 slide, since our December 20, 1988 meeting, have you  
14 encountered any safety problems at all in this area,  
15 regarding substandard or counterfeit components, that  
16 would indicate any need for immediate regulatory action?

17 MR. BRACH: The answer is no, but let me  
18 answer the question in this manner, and I'll use some of  
19 our past actions to maybe typify my -- or give an  
20 example with my answer.

21 In cases where we have identified that if it  
22 was a piping material issue, such as fittings and  
23 flanges, or multi-cased circuit breakers, or in a case  
24 of valve replacement parts, we on the part of the staff  
25 have attempted our best to take as immediate action as



1 we felt appropriate. In some cases, that involved the  
2 issuance of an information notice to be sure the  
3 industry is aware at the same time we are, of  
4 information that we've identified or developed through  
5 our regulatory process, or the issuance of bulletins to  
6 ask licensees to take specific corrective actions in  
7 those regards.

8 MR. GRIMES: But since the Commission meeting,  
9 we have not identified anymore substantial items, such  
10 as molded-case circuit breakers.

11 CHAIRMAN ZECH: That was what I really wanted  
12 to make sure that the Commission was aware of. You may  
13 proceed.

14 MR. BRACH: Slide number 6, please.

15 (Slide)

16 On the structure of the ANPR, a very obvious  
17 question when you first look at the ANPR is, why are  
18 there so many questions? And let me mention that at the  
19 outset of our development of the ANPR, we had both  
20 envisioned and started with a set of questions in the  
21 neighborhood of 12 or 15 questions but, as we started to  
22 pursue those questions from the standpoint of taking a  
23 basic premise -- for example, such as the concept of  
24 testing -- and started to try to relate that to actual  
25 -- if we were moving in a regulatory environment to a

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1 rulemaking, how would we proceed, just using the example  
2 of testing.

3 Obvious questions first start coming to mind  
4 -- is the testing involved destructive or non-  
5 destructive testing? Does the testing involve sampling  
6 on a hundred percent basis or on some statistical basis?  
7 And then as you start to work your way through those  
8 questions, further questions come up with regard to the  
9 types of materials that might be subjected to a testing  
10 program.

11 If it's involving fasteners, nuts and bolts,  
12 those are fairly amenable and are low-cost items  
13 amenable to testing? But if the item setting on the  
14 loading dock might be a completed valve or pump, your  
15 limitations on testing based on receipt are somewhat  
16 constrained.

17 So, the questions as you go through the ANPR,  
18 while appearing rather detailed, as we were looking at  
19 soliciting input from the public as far as how best to  
20 proceed in these various areas, we felt that it was very  
21 necessary to go to the level of detail in the questions  
22 and the number of questions we have, to be sure that as  
23 the public was going through their deliberative process  
24 and providing us comments, that issues that we saw or  
25 items that we saw might be issues in a regulatory

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1 development process, would hopefully be addressed in the  
2 comments we received.

3 The structure of the ANPR, as I've mentioned,  
4 has two basic parts; one part that deals with safety-  
5 related procurements, a second part that deals with  
6 procurement of commercial grade items for dedication to  
7 safety-related applications.

8 Each of the two parts has four subparts. A  
9 set of general questions that address testing -- for  
10 example, sampling traceability issues; a second item  
11 involving metallic products and parts procurements, such  
12 as piping material, fasteners, nuts and bolts and  
13 screws; non-metallic products and parts, such as  
14 lubricants, seals, filters; and the fourth part,  
15 components -- the example I used a minute ago, as far as  
16 a pump -- a whole or completed pump or valve, or other  
17 piece of equipment.

18 So, our questions are structured to try to  
19 address in a fairly significant level of detail, aspects  
20 involving if NRC were to move out with regulatory  
21 involvement in this area, what types of consideration  
22 should be brought in there.

23 Slide number 7, please.

24 (Slide)

25 As well in the ANPR to the questions I've just

1 summarized, we have asked for comment in some more  
2 general areas. There's been much discussion within the  
3 industry and between NRC and licensees and NUMARC and  
4 other industry groups, with regard to an existing EPRI  
5 standard that addresses alternatives and methods for  
6 commercial grade procurement and dedication programs.

7 The staff is aware of that document, but we're  
8 asking the public as well, if there are other standards  
9 or guides, other industry programs that might be used as  
10 an example or as a model, for us to review and consider  
11 as we go down this rulemaking process.

12 As I've mentioned earlier as well, we're  
13 asking the public for any alternative ideas or means or  
14 methods they might wish to identify.

15 The third point, and this is a very important  
16 point -- and as the Commission had mentioned to the  
17 staff at the December 20th briefing -- that it's very  
18 important to not look at the issue of procurement with  
19 blinders on, limiting yourself solely to safety-related  
20 applications or procurements, and that we're asking the  
21 public to provide comment with regard to the extension  
22 of these questions and issues that we're raising, with  
23 regard to balance of plant or nonsafety-related  
24 equipment as well.

25 Slide number 8, please.

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1 (Slide)

2 During the process of developing the ANPR,  
3 staff has had a number of related activities ongoing.  
4 We've had, as mentioned earlier, numerous meetings with  
5 NUMARC, licensees, and industry groups, discussing  
6 results of inspections and investigatory type findings  
7 with regard to inadequacies and licensee procurement and  
8 dedication programs.

9 We've issued, as summarized here, a number of  
10 bulletins and information notices during the past  
11 calendar year and, as mentioned, these cover the topics  
12 such as fasteners and fittings, flanges, molded-case  
13 circuit breakers, and valves and valve replacement  
14 parts.

15 As well, realizing that an ANPR rulemaking  
16 process is a long process of itself, and that the ANPR  
17 is the initial step, the staff has also been developing  
18 a generic letter to address near-term considerations and  
19 actions that we feel are appropriate in the near-term,  
20 to address some of the deficiencies that we've noted in  
21 the area of procurement and commercial grade dedication.

22 The staff sent to the Committee for Review of  
23 Generic Requirements, a proposed generic letter, which  
24 will be the subject of a meeting next week.

25 CHAIRMAN ZECH: Let me just make a comment on

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1 that. I think that's a very responsible action. I  
2 agree that Advance<sup>d</sup> Notice of Proposed Rulemaking is a  
3 lengthy process. I think it is a responsible action,  
4 too, because it's a new field for us, and I think it's  
5 appropriate that we ask for public comments, but your  
6 generic letter, as I understand it, will address our  
7 current NRC requirements and make sure that they are  
8 complying with them to the extent that they can, and  
9 also, perhaps, it will certainly be more timely as far  
10 as any action on the part of licensees.

11 So, I think the generic letter is very  
12 important to get out, and promptly, now, as a follow-  
13 up, too, to your bulletins and information notices so  
14 that the utilities and the industry is well alerted to  
15 this problem, but could you describe the generic letter  
16 just a little bit more in detail, so we know what your  
17 next approach is as far as current actions are taking  
18 place.

19 MR. BRACH: There are three basic elements of  
20 the generic letter. One is a request of the industry to  
21 include engineering more heavily in their procurement  
22 involvement -- engineering, from the standpoint of at  
23 the outset of procurement, to identify not only the  
24 piece of equipment that's needed, but those critical  
25 characteristics of that piece of equipment, so that as

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1 the procurement and the vendor are identified, it will  
2 be quite clear at the outset, what the critical  
3 characteristics of the piece of equipment from a--  
4 maybe it's a material composition, if it involves some  
5 environmental qualification aspects; design  
6 functionality, as far as the system -- its intended  
7 function -- to include engineering more heavily at the  
8 outset, so that those critical characteristics in that  
9 item to be procured, can be identified at the outset.

10 Also involve engineering in the receipt  
11 inspection and testing, so that as that item has been  
12 procured from an approved vendor and is received by the  
13 licensee, that engineering input as far as having  
14 initially identified what those critical characteristics  
15 are, can also be brought into play in the inspection  
16 receipt and testing program at the licensee's facility,  
17 to assure that those critical characteristics have, in  
18 fact, been met in the procurement process.

19 So, the first element involves a stronger or  
20 more heavy involvement of engineering in the procurement  
21 process. The second element is -- to the industry, to  
22 pay more attention to the oversight of audits -- excuse  
23 me -- oversight of vendors in their audit process.

24 We issued this past year, an information  
25 notice involving deficiencies that the NRC saw in audit

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1 programs of certain vendors, based on NRC inspections,  
2 as compared to inspections or audits by licensees when  
3 they had been there previously, and we had noted that in  
4 some cases, we were of the impression that the  
5 licensees' audits of their vendors had not gone to the  
6 depth necessary to assure the quality and capability of  
7 some of the vendors, their programs and their people.

8 So, the second element is a charge to the  
9 industry to improve their overall audit programs.

10 The third element involves the commercial  
11 grade dedication, or the dedication of commercial grade  
12 products to safety-related application. I had mentioned  
13 previously, an EPRI document that's just recently been  
14 issued.

15 The NRC staff has reviewed the EPRI document.  
16 The document lays out four methods for procuring  
17 commercial grade items and subjecting those to  
18 dedication and testing and acceptance testing, for  
19 eventual use in a safety-related application.

20 The third element is an NRC endorsement with  
21 minor -- or with limited considerations or reservations,  
22 on the use by licensees of the EPRI document for use in  
23 the commercial grade dedication process.

24 Those are the three basic elements of the  
25 generic letter.



1 CHAIRMAN ZECH: Thank you very much. Again, I  
2 think that's the responsible action because it's  
3 something that has more near-term possibilities. The  
4 other is responsible, too, but I think you are doing it  
5 right by going both ways.

6 MR. BRACH: Thank you.

7 CHAIRMAN ZECH: Let's proceed. Thank you.

8 MR. BRACH: Slide number 9, please.

9 (Slide)

10 This is the last slide of the presentation,  
11 and I guess both points -- the first point is, on our  
12 part, fairly straightforward. We are recommending to  
13 the Commission that in consideration of the ANPR, the  
14 Commission approve publication of the ANPR for public  
15 comment and, as noted, that we have, after further  
16 consideration, determined that 120 days for public  
17 comment and consideration is a more appropriate period  
18 than the previously recommended 60-day period.

19 That's the completion of the briefing. Do you  
20 have any questions?

21 CHAIRMAN ZECH: All right. Thank you very  
22 much. Questions from my fellow Commissioners?  
23 Commissioner Roberts?

24 COMMISSIONER ROBERTS: No.

25 CHAIRMAN ZECH: Commissioner Carr?

1           COMMISSIONER CARR:   Yes.   When I read the  
2   Appendix B that controls this area, and see what's been  
3   done to go out and find out about the problem, I'm not  
4   sure that the problem is that we haven't been requiring  
5   them to comply with Appendix B in enough detail. That's  
6   really our beef. The words are all in there that cover  
7   the item.

8           And what you're saying is, we have been  
9   somewhat lax in accepting programs that they've done,  
10   and we need to tighten that up, but we don't need to  
11   rewrite -- I don't -- I can't -- the words are there,  
12   what we -- I would think if we amplified that in a  
13   generic letter, that would solve the problem.

14           MR. TAYLOR:   Well, a lot of the problems,  
15   though, have come up through the commercial grade  
16   procurement dedication process, which has always been a  
17   difficult area to review, to -- and that's one of the  
18   purposes of this generic letter, is to really focus in  
19   on that. That's been a route that Mr. Brach has  
20   indicated has expanded as original suppliers go out of  
21   business and they get commercial grade, and they are not  
22   really doing an adequate job in many cases, and some of  
23   that -- I don't know that we have found something right  
24   now where we'd say Appendix B and its requirements ought  
25   to be changed, right?

1 MR. SNIEZEK: Let me mention, as we stated  
2 early on, Appendix B was not designed to detect fraud.  
3 Willful deceit was not the purpose of Appendix B.

4 COMMISSIONER CARR: But I don't think this  
5 will detect it either.

6 MR. SNIEZEK: I think we'll be taking a step  
7 in that direction. That's why we're asking the  
8 questions in the ANPR. Appendix B was meant to detect  
9 honest mistakes that were made. We knew people would  
10 make mistakes, and that's what it was designed for.

11 Also, all the guidance that was associated  
12 with Appendix B was designed around that. Years ago, we  
13 even said that certificates of conformance were fine--  
14 back in 1971, the staff. And, so, I think what you  
15 said, Commissioner Carr, is right. We haven't been  
16 forceful enough, but I don't think we should build on a  
17 vague rule to correct a specific problem that we see  
18 today, which is fraudulent material --

19 COMMISSIONER CARR: But the way you detect  
20 that is, you got to go look, you got to go check, you  
21 know, and that's what we require them to do anyway, and  
22 I get the impression they haven't been doing it in a  
23 thorough enough -- for instance, it bothered me that one  
24 utility did find out about, I think, the breaker  
25 problem, and said "We don't want to buy them from that

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1     guy, he looks crazy". Other guys bought them. The only  
2     difference was, he went and looked.

3             MR. TAYLOR: Yes. That's -- the introductory  
4     remarks indicated the attempt to get industry itself to  
5     look at -- the procuring organizations across the  
6     industry have a good idea where much of the procurement  
7     takes place, and they can help identify outfits that --

8             COMMISSIONER CARR: But my proposal is,  
9     though, if we hold the industry responsible for having  
10    good parts, then it's incumbent on them to go make sure  
11    they have good parts.

12            MR. SNIEZEK: Right. But --

13            MR. GRIMES: I don't think there's any  
14    disagreement, Commissioner Carr, with that.

15            COMMISSIONER CARR: And that's what we require  
16    them to do already. We've been -- I would guess we've  
17    been a little less than --

18            MR. TAYLOR: Some of the introduction of  
19    additional receipt inspection, as an example, is a way  
20    -- you know, you get certificates of conformance, yet  
21    you run additional receipt inspection. It may be  
22    simple, non-destructive tests on materials, and if you  
23    -- it may detect -- you know, that's another way.

24            COMMISSIONER CARR: But, I mean, there's no  
25    reason for us to buy receipt inspections if we want to

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1 go further than that.

2 MR. TAYLOR: I mean --

3 COMMISSIONER CARR: What we're interested in  
4 is if they have good parts.

5 MR. TAYLOR: Yes, indeed.

6 COMMISSIONER CARR: And when we find out they  
7 don't have good parts, then we tag them. And, you know,  
8 they can show you all the paper in the world, but the  
9 part is no good.

10 MR. TAYLOR: But additional testing at receipt  
11 will help -- at a utility, will help to detect --

12 COMMISSIONER CARR: But nothing keeps them  
13 from doing that now.

14 MR. TAYLOR: No, nothing does. It does not,  
15 but they met -- most of them go on certificates of  
16 conformance.

17 COMMISSIONER CARR: Which is wrong.

18 MR. TAYLOR: We're finding that out.

19 COMMISSIONER CARR: But I say, if we accepted  
20 it, but it doesn't say in here that that's what we  
21 accept --

22 MR. SNIEZEK: I understand.

23 COMMISSIONER CARR: -- so, all we have to do  
24 is say, hey, we're going to get tougher -- I think you  
25 do that in here, but I still have some problem with it.

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1 I don't think you're going to detect the guy who is  
2 fraudulent. It's --

3 MR. TAYLOR: We're going to put out more  
4 defenses.

5 COMMISSIONER CARR: Fraud is the toughest  
6 thing in the world to prove.

7 MR. GRIMES: But I think you could -- you can  
8 influence the external environment if you, for example,  
9 make it known that you are going to test products, there  
10 is less likelihood that somebody will try to go about  
11 fraud. So, I think there are things that you can do to  
12 --

13 COMMISSIONER CARR: It's a deterrent.

14 MR. SNIEZEK: Right, it's more a defense.

15 MR. GRIMES: -- to deter this type of thing,  
16 and there's other -- these things can also detect these  
17 things.

18 I would remark that this is an Advance<sup>d</sup> Notice  
19 of Proposed Rulemaking, so we have not made a final  
20 determination to go forward with a rule. And this lays  
21 out the staff's concerns in some detail and says, what  
22 is the best way to approach this? Should we go further  
23 in prescriptive rulemaking, or do we have enough and, if  
24 we have enough, why is not the implementation of what we  
25 have working? Are there some other -- is there some

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1 other form of guidance, or inspection --

2 COMMISSIONER CARR: Well, my concern is if you  
3 go with a rule, you're going to have a hard time  
4 prescribing everything. Somebody will --

5 MR. GRIMES: That's correct.

6 COMMISSIONER CARR: -- find a way out of it,  
7 and I think you've got it well covered in Appendix B,  
8 then you just have to look at the results. The guy  
9 either has good parts or he doesn't; if he doesn't, then  
10 he's got a problem.

11 MR. SNIEZEK: Yes. I think, Commissioner  
12 Carr, we agree to the basic premise, no question there.  
13 The industry does have a group that's working on this.  
14 They have already done some good work in the EPRI  
15 document, which we basically endorse, with very minor  
16 exception, which -- and that really goes a long ways  
17 towards solving the dedication process, if the industry  
18 all agrees they are going to do it that way.

19 And if they pick up in the other areas with  
20 the engineering involvement and that, and across the  
21 industry commit to do it, that would minimize the need  
22 for any further regulatory action on our part. I think  
23 your comment is well taken.

24 MR. GRIMES: I think it's important to put out  
25 on the table in some detail, our concerns, and to get

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1 public and industry response to how those concerns ought  
2 to be dealt with, and we think it's important to also  
3 reserve the right to -- the option to move further in  
4 the regulatory arena if other avenues don't work.

5 COMMISSIONER CARR: Well, what's the  
6 responsibility of the other agencies, like Underwriters'  
7 Lab, or whatever? If I go to the store and I buy myself  
8 a cord and it's got a little tag on it that says "This  
9 has been blessed" -- if that's a phony tag, whose  
10 responsibility is it to go prosecute the guy who put the  
11 phony tag on?

12 MR. GRIMES: Well, whoever finds it can bring  
13 it to the authorities at Justice.

14 COMMISSIONER CARR: No, no. I mean what  
15 agency --

16 MR. SNIEZEK: I'd rather refer that to OGC as  
17 a --

18 COMMISSIONER CARR: I mean, what agency has  
19 that responsibility? Is there an enforcement part of  
20 Underwriter Lab people?

21 MR. BRACH: With regard to the examples this  
22 past fall involving molded-case circuit breakers where  
23 UL labels and other manufacturers' labels were brought  
24 into question, we are aware, through contact with UL and  
25 other groups, that they are pursuing through the Justice



1 system, the appropriate enforcement action.

2 COMMISSIONER CARR: They have taken them to  
3 court?

4 MR. BRACH: Yes -- well, they are going in  
5 that process. Where they are, I'm not sure, but they  
6 are taking legal -- they are following their legal  
7 options.

8 MR. TAYLOR: In fact, those major suppliers  
9 where someone has counterfeited what they would normally  
10 do, and then they slap a UL label on it, the major  
11 suppliers -- their health is impugned by it, and  
12 damaged, and --

13 COMMISSIONER CARR: I wasn't particularly  
14 thinking of a power plant, I'm just thinking of my  
15 extension cord I go in and buy and it's got a tag on it.

16 MR. TAYLOR: We hope it's good.

17 (Laughter.)

18 COMMISSIONER CARR: If it isn't good, though,  
19 whose responsibility is it that that tag is not a lie?

20 MR. TAYLOR: Well, that's -- should I play  
21 attorney?

22 MR. PARLER: You're looking at me, but  
23 whenever you answer any question like that, you have to  
24 have the facts. It depends on, for example, what's on  
25 the tag. Have you ever looked at the tag when you go

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1 into a parking lot? The tag, in effect, says that  
2 "we're responsible for nothing".

3 (Laughter.)

4 MR. PARLER: So, you have to look at the  
5 facts. And I'll be delighted to look at the facts. I  
6 might add that it is my understanding that in the last  
7 couple of years, a federal law has been enacted in this  
8 area, applicable to counterfeit material. It is my  
9 understanding that the matters that you were involved in  
10 in California, involving Square D -- the Square D  
11 Company, and that perhaps the Square D Company decided  
12 to pursue their legal remedies under this law.

13 So, in part, that would be an answer to your  
14 question, but when you get beyond the coverage of a law  
15 like that, you start looking at what a label means and  
16 what the legal responsibilities are, that's another  
17 question that involves facts. You find out whoever  
18 probably the manufacturer is and who has the most  
19 resources so that if you are successful in your suit,  
20 you could get some recovery rather than just a moral  
21 victory, but I'll be glad to look into it for you.

22 COMMISSIONER CARR: No, no, that's -- I  
23 understand we've been buying the label on this  
24 Commission, instead of looking behind it, I think.

25 MR. PARLER: Well, Mr. Commissioner, I think

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1 that your basic point is that the words, the basic  
2 words, are there if they were fleshed out in Appendix B  
3 to Part 50, is correct, and also that for the commercial  
4 grade products which may be dedicated as basic  
5 components in nuclear power plants, that general problem  
6 -- maybe it's not specific enough to cover the details  
7 -- obviously, it isn't -- is covered in section 206 of  
8 the Energy Reorganization Act, which is implementing  
9 regulations in Part 21. So, it's the combination of the  
10 Part 21 and the Appendix B to Part 50.

11 Now, that's the point of departure. Whether  
12 or not something beyond that needs to be done, I  
13 certainly defer to these gentlemen completely.

14 COMMISSIONER CARR: That's all I have.

15 CHAIRMAN ZECH: Thank you. Commissioner  
16 Rogers?

17 COMMISSIONER ROGERS: Well, just a thought,  
18 you know, after having looked at this for sometime now,  
19 what is your belief as to whether this is an old problem  
20 that's been around for a long time and we're just  
21 discovering it, or whether it's -- there's a flurry of  
22 -- I mean, there's always been fraud, I'm sure, since  
23 time immemorial -- but whether the general level of what  
24 exists out there has increased in recent years, or  
25 whether we're just discovering something that's been

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1 about at this level for the last couple of decades?

2 MR. TAYLOR: Well, maybe Mr. Hayes would be in  
3 the best position to answer that, from his perspective.

4 MR. HAYES: Commissioner, I can give you a  
5 view from the documents that we have looked at in the  
6 numerous investigations we have conducted.

7 We, somewhat arbitrarily, decided to look at  
8 five years' worth of documents. To go back further  
9 would just be so burdensome, and we didn't think it  
10 would add to identifying safety concerns.

11 In the past five years, we have been able to  
12 find in those years, false documents or indications that  
13 we've had problems at least over the last five years,  
14 but I agree with you, I'm of the opinion, having been in  
15 this business for a few years, that it has probably been  
16 there, but my sense is not to the degree that we see  
17 today because of the various supply houses shutting down  
18 --

19 COMMISSIONER ROGERS: Well, that's --

20 MR. HAYES: -- and expenses are getting--  
21 when there's money to be made, people are going to  
22 design a way to get the money, and it's more opportune  
23 now, I guess, is where we're at.

24 COMMISSIONER ROGERS: Well, of course, you  
25 know, connected with that concern is, what about those

1 parts that are out there that have not been detected,  
2 either through our records or anything else, and we're  
3 focusing here on procurement, but that's -- there's  
4 already some bad materials out there in the field, in  
5 stockrooms and warehouses. To what extent do you think  
6 that needs to be cleaned up?

7 MR. TAYLOR: Well, there's always  
8 functionality testing, which is one of the great back-  
9 ups to the procurement concept, and that is one of the  
10 assurances of function, and that's one of the key safety  
11 backups to any introduction of materials that won't  
12 operate properly.

13 MR. SNIEZEK: I think to add on that a little  
14 bit, Jim, is that although we said Appendix B was not  
15 designed to detect fraudulent materials, that does help  
16 to detect fraudulent materials. That is a stop-gap.

17 I think if you looked at the construction  
18 testing that goes on, the pre-operational testing  
19 programs, the start-up testing programs, and the day-to-  
20 day surveillance in the power plants, plus looking at  
21 the equipment performance over many years, it shows us  
22 there may be something. We design for defense in-depth,  
23 and so far it's working.

24 We're looking to prevent -- if, in fact, as  
25 Mr. Hayes indicated, it has gotten worse -- how do we

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1 cut it off now, to prevent or deter fraudulent materials  
2 from getting into the plants?

3 MR. GRIMES: I would also add that we are  
4 thinking along those same lines. In other words, we  
5 found the molded-case circuit breakers to be a high-  
6 volume, common component, but what other components in  
7 the plant should we be sampling and testing? We were  
8 thinking of that, as Mr. Taylor said in his opening  
9 remarks, we hope the industry, with their greater  
10 expertise in these areas, might be focusing on some of  
11 the areas which they think might be vulnerable.

12 MR. TAYLOR: That's where we're looking, and  
13 where are the logical places because, when you buy some  
14 big castings and that type of thing, you usually buy  
15 them from a normally long-established supplier, supplies  
16 the Code, under the Code, the Code stamp. Yet, there  
17 are a lot of items out there that have -- wear out, that  
18 have to be replaced. They can be as mundane as pump  
19 rings, wear rings and, so, there's a whole -- and what  
20 types of outfits are supplying those? How confident are  
21 you, the industry, in those suppliers? What do you have  
22 to back up?

23 CHAIRMAN ZECH: Mr. Hayes, you had another  
24 comment?

25 MR. HAYES: Let me give you an example of the

1 complexity of trying to even back-step and back-trace  
2 the product.

3 We have a valve, a fairly large valve, with  
4 counterfeit parts inside -- stems and what have you.  
5 It's at one particular utility now. They didn't install  
6 the guts of the valve, as it were. They got it from  
7 another utility.

8 We go there, and they said, "Well, we didn't  
9 do it either". As you follow the paperwork, it just  
10 kind of -- it just kind of goes out into nothing. And  
11 I'm uncertain at this point that we'll ever determine  
12 who actually refurbished or originally manufactured that  
13 particular valve, the point being, it's my view that you  
14 cannot rely upon the paper with a hundred percent  
15 certainty, without really looking inside the component  
16 itself, to insure that those components are, in fact,  
17 the proper standards.

18 COMMISSIONER ROGERS: Well, that's the kind of  
19 thing I was thinking about.

20 COMMISSIONER CARR: We're kind of raised in  
21 that society. I mean, you can go buy your auto parts  
22 from the manufacturer, or you can get them from NAPA, or  
23 you can get them from the junkyard, and people do all  
24 the above.

25 CHAIRMAN ZECH: Commissioner Curtiss?

1                   COMMISSIONER CURTISS: Just a couple of quick  
2 questions. It wasn't clear to me what the relationship  
3 of the generic letter was to the ANPR. Is the generic  
4 letter just an amplification of requirements that we  
5 have today? It simply restates and reiterates and says  
6 "Follow these requirements"?

7                   MR. BRACH: That's correct.

8                   MR. SNIEZEK: I think it's an extension. It's  
9 a new staff position on what's necessary to comply with  
10 existing requirements. So, it is more than -- it's to  
11 insure compliance with existing requirements, but it's a  
12 new staff position to give adequate assurance that there  
13 is compliance.

14                  COMMISSIONER CARR: Almost complying to  
15 receipt inspection.

16                  MR. SNIEZEK: Right.

17                  COMMISSIONER CURTISS: Just one further quick  
18 question on that. It looks to me like that approach is  
19 going to relay to a greater degree on the engineering  
20 resources, getting them involved in the receipt  
21 inspection process. Have we looked at the extent to  
22 which that will require a commitment of additional  
23 resources by the utilities, or stretch their current  
24 engineering capabilities thinner than we would like? Do  
25 you have a feel for that?



1 MR. BRACH: No, we have not, as far as they  
2 have resource impact but, on the other hand, the  
3 engineering involvement on the part of procurement,  
4 either is going to come in at the outset which, to me,  
5 would be the more effective time to bring engineering in  
6 and identifying critical characteristics and receipt  
7 inspection testing on that piece of equipment when it  
8 comes in, than after the fact, when the piece of  
9 equipment has already been procured and there might be  
10 some difficulties with regard to its application or  
11 operation or put into service.

12 So, the engineering is going to be involved in  
13 resolution of the issue, either resolution at the outset  
14 in assuring that proper characteristics are identified  
15 and verified on receipt, or perhaps after the fact, in  
16 going through equipment modification or alteration or  
17 maybe subsequent modification.

18 COMMISSIONER CURTISS: You see it as a wash,  
19 on the whole?

20 MR. BRACH: I see it as being a more efficient  
21 use of engineering resources at the outset.

22 MR. GRIMES: It's not, I would say -- and  
23 we're not talking about the engineer actually doing the  
24 measurement, but being involved in specifying what  
25 measurements are to be made.

1 COMMISSIONER CURTISS: Just one quick question  
2 then, on the ANPR. Could you expand a little bit on the  
3 rationale for including the balance of plant in the  
4 questions that are asked?

5 MR. BRACH: Yes. If you recall, we discussed  
6 on a couple of occasions concerns we've seen in  
7 commercial grade procurements by nuclear power plants,  
8 where those commercial grade procurements, in many  
9 cases, are dedicated -- are subjected to testing and  
10 subsequently dedicated for safety-related application.

11 A number of the instances we've seen of  
12 apparent counterfeit and fraudulent vendor products have  
13 involved those in the commercial grade market. A reason  
14 for, in the ANPR, asking for public comment with regard  
15 to what requirements, if any, should be on the part of  
16 NRC, extrapolated further from safety-related arena to  
17 the balance of plant arena, is to address -- I'll say  
18 the recognition on our part -- that in the commercial  
19 grade product arena, there are, I'll say, more apparent  
20 questions or issues involving suspect or counterfeit  
21 vendor products.

22 MR. GRIMES: Perhaps we could put it in the  
23 perspective of the safety-related components being a--  
24 perhaps an island of equipment that you want to be  
25 absolutely sure is there to respond to challenges that

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1 the plant may see, but things coming into other parts of  
2 the plant outside that island can cause those  
3 challenges. So, we would like to -- or complicate the  
4 recovery from some event. So, we would like to minimize  
5 -- and we fully expect that good engineering practices  
6 used throughout the plant would minimize -- and,  
7 specifically, Appendix B only speaks to safety-related  
8 -- however, our general design criteria and things are  
9 meant to assure that good engineering practice  
10 throughout the plant. So -- and I think the industry is  
11 coming to believe that they must -- whether it's  
12 maintenance or procurement, they must treat all the  
13 things that go into the plant with some care, to make  
14 sure they have a safe and efficient operation.

15 COMMISSIONER CURTISS: We're really looking  
16 for here, the balance of plant areas where we see  
17 vulnerabilities, or potential for vulnerabilities, not  
18 just a broad overview of the entire balance of plant.  
19 We're looking for sensitivity of individual areas.

20 MR. GRIMES: Yes. Certainly, the restrooms  
21 don't need as much attention as the feedwater system.

22 COMMISSIONER CARR: Well, the balance of plant  
23 is a personnel safety item.

24 MR. GRIMES: In addition, that's true, too.

25 COMMISSIONER CURTISS: Maybe it would make

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1 sense -- and I'd like to think about this, but in  
2 response to Commissioner Carr's question, maybe it would  
3 make sense at some point in the list of questions, <sup>than</sup> if we  
4 asked -- and it might be appropriate right at the first  
5 where we ask is the criteria adequate, maybe we ought to  
6 ask if the framework in Appendix B of Part 50 and Part  
7 21 provides a sufficient framework without additional  
8 regulatory criteria, and get some response on that. Let  
9 me think about that and see about soliciting some  
10 discussion on that point, from the licensees.

11 MR. GRIMES: Yes. I think perhaps we've asked  
12 about general regulations, but we could specifically  
13 identify, I suppose, Appendix B and Part 21 as an area  
14 of inquiry.

15 COMMISSIONER CARR: Can I make one more  
16 comment?

17 CHAIRMAN ZECH: Yes, please.

18 COMMISSIONER CARR: The problem that I see is  
19 how you are going to tie the responsibility through the  
20 seven tiers of subcontractors. I mean, it's the  
21 problem, if anyone is trying to follow the paperwork,  
22 and when you get down to the guy who made the nut or the  
23 stem, and he's seven tiers down from the guy that  
24 assembled the valve, you're depending on every  
25 contractor to go down to his sub, and that sub to go

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1 down to his sub, and I'm not sure we've set that system  
2 up at all.

3 MR. GRIMES: Well, the Appendix B is meant to  
4 be passed on, and Part 21 requirements are meant to be  
5 passed on to the point where somebody may buy something  
6 commercial grade and dedicate it in that series of  
7 suppliers. So, at some point, you're faced, usually,  
8 with that dedication process, whether it's done by the  
9 person that builds the pump, and he buys the rings and  
10 determines that they're okay --

11 COMMISSIONER CARR: On each layer, that's  
12 depending on the layer that gave it to him --

13 MR. GRIMES: Yes.

14 COMMISSIONER CARR: -- and without necessarily  
15 the required amount of follow-up.

16 MR. GRIMES: I mean, I think it emphasizes the  
17 importance of long-term relationships with reliable  
18 vendors, rather than procurement departments optimizing  
19 on the lowest available price, and I think utilities  
20 would be well-served to think about building those  
21 relationships with key suppliers.

22 COMMISSIONER CARR: That will happen with  
23 standardization.

24 MR. HAYES: It seems like the ultimate end  
25 user, basically, bears the burden to justify the

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1 product.

2 COMMISSIONER CARR: Sure, but that's a long  
3 chain.

4 MR. HAYES: No question. Let me add one other  
5 thing. I'm not sure it's been highlighted in previous  
6 Commission briefings. At least from our perspective, we  
7 are finding that some licensees are purchasing  
8 commercial grade equipment from a major manufacturer, or  
9 at least it bears a major manufacturer label -- it bears  
10 a UL symbol on it, affixed to that particular component,  
11 and one has to then go to the catalog of that particular  
12 supplier and look up, and they can see the specs on that  
13 component, and there's a lot of reliability then, by the  
14 end user, that they have the right product because, in  
15 the catalog, it says it will bear these standards.

16 The problem, I think, is that, you know, we've  
17 been able to point out that that still doesn't give you  
18 the assurance that I think staff is suggesting that  
19 we're going to start requiring because everything just  
20 can't be relied upon, and that's where we are.

21 COMMISSIONER CARR: Just like some stolen car.

22 MR. HOYLE: That's about it, Commissioner.

23 COMMISSIONER CARR: Give you all the paperwork  
24 you want.

25 MR. HAYES: Yes, sir.

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1 CHAIRMAN ZECH: All right. Well, let me just  
2 say I think we can see the challenges -- first of all,  
3 the challenge from NRC to make sure that we have  
4 properly carried out our responsibilities here.

5 It looks like the staff's actions regarding  
6 notices, bulletins, generic letters, Advance Notice of  
7 Proposed Rulemaking -- and we have gotten attention from  
8 other agencies in our government as well as the industry  
9 and utility that we license, as far as the licensees are  
10 concerned, and the industry, it seems to me that we've  
11 also discussed today that we already have regulations  
12 covering many of these subjects, but we had them cover  
13 mostly -- and we had in mind poor quality, as you  
14 pointed out early in the briefing, rather than  
15 fraudulent type actions, but here we recognize  
16 fraudulent is something that we have to deal with.

17 So, even though -- and I think we should make  
18 every effort, as we've pointed out here today, too, to  
19 make sure that our regulations are complied with because  
20 that's the utility's responsibility, that's the  
21 licensee's responsibility, to comply with our  
22 regulations.

23 The generic letter we are going to put out, I  
24 presume, is an extension to point out that we have  
25 regulations that they need to comply with, and that add

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1 any further guidance that we feel is necessary. I think  
2 that's appropriate action to take, but it is the  
3 licensee's responsibility. That means their procurement  
4 process has got to be looked into, and their inspection  
5 process, the testing process, and so forth, and we can't  
6 just rely on the paperwork check, it would appear, as we  
7 have in the past, with some perhaps false confidence.

8 When we know that there is going to be  
9 fraudulent material going in our power plants, it's a  
10 very serious situation, and I think it behooves not only  
11 us to take a regulatory action, but the licensee also,  
12 to not only comply with our regulations, perhaps a lot  
13 more rigorously than he has in the past, knowing that  
14 there's reason for suspicion, but also to take even a  
15 step further and to see whether or not his procurement  
16 testing inspection techniques are, indeed, satisfactory,  
17 and for us to look at that, to see whether we think they  
18 are satisfactory.

19 I would imagine this is what we would expect  
20 to get from Advance Notice of Proposed Rulemaking to an  
21 extent but, in the meantime, I think we should be  
22 concerned about the immediate problem and make sure that  
23 we don't have any safety problems out there.

24 So, I think we've got to recognize that we  
25 have a real problem, a very real problem. It's a now

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1 problem, not a problem that's going to perhaps ever go  
2 away. So, it is a new way to look at some of the parts  
3 that have been going into our power plants, and I think  
4 it's realistic but necessary that we look at in a very  
5 tough, real, inquisitive sort of way.

6 So, I think the approaches that we are taking  
7 are correct. I do think that we should -- we need to go  
8 out with this Advance Notice of Proposed Rulemaking. I  
9 urge my colleagues who haven't voted yet, to address it  
10 very promptly. And I would also encourage the staff to  
11 continue working, as you pointed out earlier, very  
12 closely with the Office of Investigations because  
13 another part of the issue, which we didn't discuss today  
14 because I know the investigations are ongoing, it would  
15 not be appropriate to discuss the details of that here  
16 today, but that's very real, and it's important that we  
17 ferret out those companies and those individuals that  
18 are responsible for bringing forth the substandard  
19 equipment into our power plants. It's a public health  
20 and safety issue.

21 And I recognize, Mr. Hayes, that it's  
22 difficult and you have to go a long way down, but I'd  
23 hope you'd be diligent in doing that because somewhere  
24 along the line I think it is possible, myself, that we  
25 can find out the individuals and the companies and who

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1 is doing this, and nail them because it's wrong, and I  
2 think that we have to address it in a very tough manner.

3 We're dealing with the public health and  
4 safety, that's our responsibility. I think we have  
5 every right, responsibility and obligation to work to  
6 find out where this is coming from and to put a stop to  
7 it as best we possibly can.

8 So, I think the cooperation between the staff  
9 and the Office of Investigations is very important. I'd  
10 also encourage the staff to continue the close  
11 cooperation with the other government activities, so  
12 that they will be aware of, and we will be aware of,  
13 anything that might turn up on this matter, with the  
14 other government agencies.

15 Are there any other comments from my  
16 colleagues before we adjourn?

17 (No response.)

18 Thank you very much for an excellent briefing.  
19 We're right on track. We stand adjourned.

20 (Whereupon, at 2:57 p.m., the meeting was  
21 adjourned.)

22

23

24

25

CERTIFICATE OF TRANSCRIBER

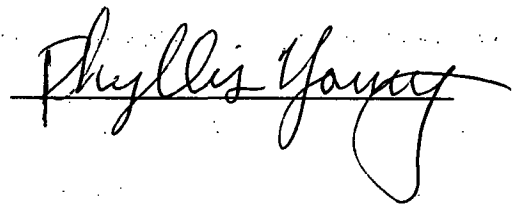
This is to certify that the attached events of a meeting  
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TITLE OF MEETING: BRIEFING ON PROPOSED RULEMAKING ON  
SUBSTANDARD COMPONENTS

PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: FEBRUARY 2, 1989

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ADVANCE NOTICE OF PROPOSED  
RULEMAKING (ANPR)

"ACCEPTANCE OF PRODUCTS PURCHASED FOR  
USE IN NUCLEAR POWER PLANT STRUCTURES,  
SYSTEMS AND COMPONENTS"

FEBRUARY 2, 1989

EXISTING QUALITY REQUIREMENTS

- ° PROCEDURES AND ACTIONS CONFORMING TO APPENDIX B,  
QUALITY ASSURANCE REQUIREMENTS
  - EXPECTED TO DETECT SUBSTANDARD AND POOR QUALITY  
PRODUCTS
  - NOT DESIGNED TO DETECT COUNTERFEIT OR FRAUDULENTLY  
MARKETED PRODUCTS

### PROCUREMENT OPTIONS

- ° TWO ALTERNATIVES FOR SATISFYING REQUIREMENTS
  - PROCURE AS SAFETY-RELATED FROM APPROVED VENDOR
  - PROCURE COMMERCIAL GRADE PRODUCT AND DEDICATE FOR SAFETY-RELATED APPLICATION

#### CURRENT ISSUES/PROBLEMS

- ° INSTANCES OF COUNTERFEIT AND FRAUDULENT VENDOR PRODUCTS HEIGHTEN CONCERN ON ADEQUACY OF PROCUREMENT PROGRAMS
- ° RECENT DISCOVERIES DEMONSTRATE CURRENT PRACTICES HAVE NOT ALWAYS BEEN SUFFICIENT
- ° PROBLEMS DETECTED IN BOTH PROCUREMENT AND DEDICATION PROGRAMS

#### GOAL OF ANPR

- ° SOLICITS PUBLIC COMMENTS ON NEED FOR ADDITIONAL REGULATORY REQUIREMENTS
  - ARE NEW REGULATORY REQUIREMENTS NECESSARY?
  - WHAT SHOULD BE INCLUDED IN ANY NEW REGULATORY REQUIREMENTS?
  - ALTERNATIVE METHODS FOR ENSURING THE ACCEPTABILITY OF PURCHASED PRODUCTS
- ° ANPR TO BE PUBLISHED FOR 120 DAY PUBLIC COMMENT PERIOD



### STRUCTURE OF ANPR

- ° SIMILAR QUESTIONS FOR PRODUCTS PROCURED AS  
SAFETY-RELATED (APPENDIX B QA PROGRAM) AND  
FOR DEDICATION PROGRAMS OF COMMERCIAL GRADE  
PRODUCTS
  - GENERAL QUESTIONS
  - METALLIC PRODUCTS/PARTS
  - NONMETALLIC PRODUCTS/PARTS
  - COMPONENTS

ADDITIONAL ANPR QUESTIONS

- ° ENDORSEMENT OF OTHER STANDARDS OR PROGRAMS
- ° OTHER ALTERNATIVE MEANS
- ° EXTENSION OF REQUIREMENTS TO NONSAFETY-RELATED EQUIPMENT

### INTERIM STAFF ACTIONS

- ° NUMEROUS MEETINGS WITH INDUSTRY
- ° GENERIC COMMUNICATIONS ISSUED IN 1988
  - TWO BULLETINS AND FOUR SUPPLEMENTS
  - FOUR INFORMATION NOTICES AND THREE SUPPLEMENTS
- ° GENERIC LETTER TO ADDRESS NEAR TERM ACTIONS IN PROCESS

### CONCLUSIONS

- ° RECOMMEND COMMISSION APPROVE PUBLICATION  
OF ANPR FOR PUBLIC COMMENT
- ° STAFF NOW RECOMMENDS LONGER COMMENT PERIOD  
OF 120 DAYS



January 17, 1989

## **RULEMAKING ISSUE**

SECY-89-010

(Notation Vote)

For: The Commissioners

From: Victor Stello, Jr.  
Executive Director for Operations

Subject: ADVANCE NOTICE OF PROPOSED RULEMAKING, "ACCEPTANCE OF  
PRODUCTS PURCHASED FOR USE IN NUCLEAR POWER PLANT  
STRUCTURES, SYSTEMS AND COMPONENTS"

Purpose: To obtain approval to publish the enclosed Advance Notice of  
Proposed Rulemaking (ANPR) (Enclosure 1) for public comment.  
The purpose of the notice is to solicit public comment addressing  
whether regulatory actions may be necessary and appropriate to  
assure that products purchased for use in nuclear power plants  
will perform the functions necessary to protect the public health  
and safety.

Background: Recent experience has shown that some products purchased for use  
in nuclear power plant structures, systems and components are  
substandard, have falsified records, or have been otherwise mis-  
represented. The recognition of the potential safety significance  
of these circumstances has led to the issuance of several NRC  
bulletins and information notices (Enclosure 2). These bulletins  
and information notices were issued to assure that licensees,  
including Construction Permit holders, were informed and that  
they were prepared to take actions to prevent inadequate products  
from being installed in nuclear power plants.

A generic letter is being prepared to inform licensees that an  
effective receipt inspection and testing program is considered  
appropriate to enhance the probability that any product installed  
will perform as expected. The generic letter will also describe  
processes that licensees may use to dedicate commercial grade  
products for use in safety-related applications. The generic  
letter will request licensees to inform the Commission of the  
status of the implementation of such processes and the date of  
implementation.

The Chairman notified Congressman Dingell in the response to the  
Congressional Subcommittee on Oversight and Investigations report  
"The Threat From Substandard Fasteners: Is America Losing It's  
Grip?" that the Commission was considering publishing an ANPR to

CONTACTS: Max J. Clausen, NRR  
X20969

Donald S. Brinkman, NRR  
x23216

obtain comments on enhanced receipt testing requirements at nuclear power plants. This ANPR satisfies that commitment.

Discussion:

This ANPR solicits public comment on a list of issues related to the procurement of products for use at nuclear power plants. The issues are posed in the form of questions to solicit views on what regulatory action, if any, is necessary to enhance the probability that structures, systems and components installed in nuclear power plants will perform as expected; that is, perform their intended safety functions or perform their normal functions in a manner that will avoid challenges to the plant safety systems.

This ANPR poses questions with respect to actions necessary to assure the quality of both products procured to be installed in safety-related applications and commercial grade products to be dedicated for subsequent installation in safety-related applications. The ANPR states that it is the Commission's position that the licensee's engineering staff should be involved in the procurement process of products procured as safety-related as well as commercial grade products dedicated and upgraded for use in safety-related applications. This involvement should include (1) selection of products to be used in the plant, (2) determination of the critical characteristics of the selected products that are to be verified during product acceptance, (3) determination of specific testing requirements applicable to the selected products, and (4) evaluation of test results.

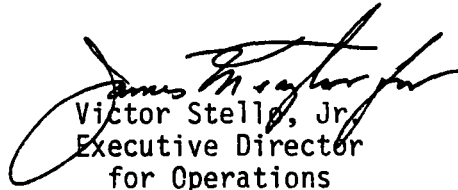
The ANPR solicits comments on the efficacy of other agency/organization standards or programs and on the extent to which the additional controls being contemplated should be extended to non-safety-related applications in the "balance of plant" structures, systems and components. The questions solicit descriptions of alternative approaches that may effectively provide the assurances needed for the Commission to find that the products purchased for use in nuclear power plants will perform to protect the public health and safety.

Conclusions/

Recommendations: That the Commission approve publication of the advance notice of proposed rulemaking for comment in the Federal Register.

Coordination:

The Committee to Review of Generic Requirements has been briefed on this ANPR and has no objections. The Office of the General Counsel has no legal objections.

  
Victor Stello, Jr.  
Executive Director  
for Operations

Enclosures:

1. ANPR
2. NRC Information Notices and Bulletins

Commissioners' comments or consent should be provided directly to the Office of the Secretary by c.o.b. Friday, February 3, 1989.

Commission Staff Office comments, if any, should be submitted to the Commissioners NLT Wednesday, January 25, 1989, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional time for analytical review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

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Enclosure 1

ADVANCE NOTICE OF PROPOSED RULEMAKING



## NUCLEAR REGULATORY COMMISSION

## 10 CFR Part 50

Acceptance of Products Purchased for Use in  
Nuclear Power Plant Structures, Systems and Components

AGENCY: Nuclear Regulatory Commission.

ACTION: Advance Notice of Proposed Rulemaking.

SUMMARY: The Nuclear Regulatory Commission (Commission) is proposing to develop regulations requiring enhanced acceptance procedures including, but not limited to, receipt inspection and testing of products purchased for use in nuclear power plant structures, systems and components. This Advance Notice of Proposed Rulemaking (ANPR) is intended to solicit comments on the need for additional regulatory requirements and to obtain an improved understanding of alternatives to regulatory requirements that could provide assurance that structures, systems and components procured for use in nuclear power plants will perform as expected to protect public health and safety.

DATE: The comment period expires (60 days after publication). Comments received after this date will be considered if it is practical to do so, but assurance of consideration cannot be given to comments received after this date.

ADDRESSES: Mail comments to: The Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch.

Deliver comments to: 11555 Rockville Pike, Rockville, Maryland, between 7:30 a.m. and 4:15 p.m. Federal workdays.

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Examine copies of comments received at: The NRC Public Document Room, Gelman Building, 2120 L Street, NW, Washington, D.C.

FOR FURTHER INFORMATION CONTACT: Max J. Clausen, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.  
Telephone (301) 492-0969.

#### SUPPLEMENTARY INFORMATION:

##### Background

Appendix B to 10 CFR Part 50 of the Commission's regulations adopted in 1970 (35 FR 10498) establishes the quality assurance criteria for safety-related structures, systems and components for nuclear power plants. The purpose of the quality assurance criteria in Appendix B is to provide requirements for the design, procurement, receipt inspection and testing, construction and operation of nuclear power plant structures, systems and components. The criteria are generally structured to confirm the quality of products designed, purchased, inspected, tested and installed for use in nuclear power plant structures, systems and components. The criteria apply to all activities conducted during the design, construction and operating phases of nuclear power plants that affect the safety-related functions of structures, systems and components. Procedures and actions by licensees and their representatives conforming to these criteria are expected to detect substandard and poor quality products but may not necessarily detect counterfeit or fraudulently marketed products. Recent cases involving apparently substandard, counterfeit and

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fraudulently marketed products for nuclear power plant structures, systems and components have prompted the Commission to reconsider the adequacy of current regulations for detecting substandard, counterfeit and fraudulently marketed products and for assuring that such products are not used in nuclear power plant structures, systems and components.

Criteria III, IV, VII, VIII, and XV of Appendix B to 10 CFR Part 50 provide the criteria for the control of purchased structures, systems and components for nuclear power plants. Historically, licensees and their representatives have purchased products with certifications attesting to the quality of the products and have depended heavily on the certifications as a basis for accepting the products. However, recent discoveries of substandard, counterfeit and fraudulently marketed products furnished to nuclear power plants by contractors and subcontractors demonstrate that current product acceptance practices, including those based heavily on certifications and stated catalog specifications, have not been sufficient in all cases. Additional details of apparently substandard, counterfeit, and fraudulently marketed products are contained in NRC Compliance Bulletin No. 87-02 and Supplements 1 and 2, NRC Bulletin No. 88-05 and Supplements 1 and 2, NRC Bulletin No. 88-10, NRC Information Notice No. 88-19, NRC Information Notice No. 88-35, NRC Information Notice No. 88-46 and Supplement 1, NRC Information Notice No. 88-48, and NRC Information Notice No. 88-97.<sup>1</sup>

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<sup>1</sup> These documents are available for inspection at the Commission's Public Document Room, Gelman Building, 2120 L Street, NW, Washington, D.C.

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In many cases, as in part discussed in the referenced bulletins and information notices, product acceptance practices have failed to detect such substandard, counterfeit or fraudulently marketed products. Therefore, the Commission is considering the need for additional regulations or other methods to provide an acceptable level of assurance that products purchased for use in nuclear power plant structures, systems and components satisfy requirements and specifications imposed to provide confidence that these items will perform as expected and required to protect the public health and safety.

The Commission's regulations provide two alternative approaches to assure that structures, systems and components satisfy requirements for safety-related applications. A licensee may procure products to the requirements of the applicable code or standard for the safety-related structure, system or component. Alternatively, the licensee may purchase a commercial grade product and then, using the appropriate procedures and satisfying the Commission's requirements, dedicate the commercial grade product for the safety-related application. The experiences that have been discussed in the bulletins and information notices previously referenced apply to products that were obtained using both of these approaches.

The Commission has concluded that significant engineering involvement is required during the procurement process for products used in nuclear power plants and during any testing of these products. It is the Commission's view that, in the past, inadequate engineering involvement has been a common weakness in licensees' procurement programs, particularly when commercial grade procurements were involved. It is the Commission's position that involvement of a licensee's engineering staff in the procurement process should include (1) selection of

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products to be used in the plant, (2) determination of the critical characteristics of the selected products that are to be verified during product acceptance, (3) determination of specific testing requirements applicable to the selected products, and (4) evaluation of test results. This involvement should be applicable to products initially procured as safety-related as well as commercial grade products procured for dedication and upgrading for use in safety-related applications. The extent of this engineering involvement will be highly dependent on the nature and use of the products involved.

The Commission is concerned about the quality of commercial grade products that are used throughout the nuclear plant, including applications in the "balance of plant" structures, systems and components. This concern stems from a recognition that structures, systems and components may not function as designed and may challenge safety-related systems unnecessarily or complicate the response to off-normal events if a product is substandard. Commenters are requested to consider the issues and questions in this ANPR as they may relate to the need or desirability for either more prescriptive regulations or, alternatively, a performance-based requirement. Comments are also requested on the desirability of any such requirement for safety-related applications, as well as for applications throughout the plant.

A broad spectrum of issues needs to be considered before the Commission decides on the scope and content of any proposed new regulatory requirements addressing the concerns raised by the experience of licensees placing essentially complete reliance on certificates, such as Certificates of Compliance, and the evidence that

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some contractors are misrepresenting products. This experience is discussed in the referenced bulletins and information notices. The following questions are posed to raise the issues that the Commission has identified and are not to be considered complete nor are they intended to bound the scope of public comment on this ANPR. The questions are structured in two categories: (1) Products Procured for Use in Safety-Related Structure, System and Component Applications, and (2) Dedication of Commercial Grade Products for Use in Safety-Related Structure, System and Component Applications.

Public comments are invited on each of these questions. The comment resolution process will be improved if each comment is identified to the question to which it responds. Commenters may submit, in addition to the original paper copy, a copy of the letter in an electronic format on IBM PC-DOS compatible 3.5 or 5.25 inch double sided double density (DS/DD) diskettes. Data files should be provided in ASCII code or, if formatted text is required, data files should be provided in IBM Revisable-Form Text Document Content Architecture (RFT/DCA) format.

1. Products Procured for Use in Safety-Related Structure, System and Component Applications.

The questions in this section are categorized in four subsections: General, Metallic Products, Nonmetallic Products, and Components.

## 1.1 General

1.1.1a In view of the problems that have been detected with substandard, counterfeit, or fraudulently marketed products, do the Commission's current regulations provide adequate criteria for ensuring the acceptability of purchased products?

1.1.1b If the current regulations are considered to provide adequate criteria, how should they be applied to ensure that substandard, counterfeit, and fraudulently marketed products are detected and precluded from use in nuclear power plants?

1.1.1c If the current regulations do not provide adequate criteria, should the Commission establish specific requirements or performance-based requirements to ensure that products purchased for use in nuclear power plant structures, systems and components satisfy the operational requirements necessary to protect public health and safety?

1.1.2a What traceability requirements should be imposed for all products to be used in safety-related structures, systems and components?

1.1.2b Should material traceability through all intermediary contractors, subcontractors and processors be required?

- 1.1.2c Should all critical characteristics, for example, materials, operations, functions, etc., be traceable?
- 1.1.2d Should there be any exceptions to the traceability requirements?
- 1.1.2e What should the identification requirements be for traceability, for example, uniquely marking each part whenever possible, bagging, records, etc.?
- 1.1.3 Should product acceptances be restricted to inspections and tests or should product acceptances include, on a sample basis, destructive inspections and tests to verify chemical and physical characteristics?
- 1.1.4 What types of inspections and tests (appropriate for the various types of products) should be required?
- 1.1.5 Should licensees, contractors and subcontractors be encouraged to perform joint testing?
- 1.1.6 If destructive inspections and tests are determined necessary, what should be the sampling basis (per vendor, per purchase order, per shipment, per lot, per container, etc.)?
- 1.1.7 Should sample plan testing be permitted for testing or should such testing be on a 100 percent basis?



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- 1.1.8 What sort of statistical sampling during product inspection is adequate to provide confidence that the product has the requisite assurance of quality?
- 1.1.9 What criteria should be used for allowing sample plan testing during product acceptance?
- 1.1.10 Should the shelf life of appropriate types of structures, systems and components be inspected and verified as acceptable during product acceptances?
- 1.1.11 To what extent will an effective vendor audit program and maintenance of a qualified vendor list reduce the likelihood of questionable products being used in nuclear power plants?
- 1.1.12 What are the essential elements, for example, team composition, depth of audits, and approach, that must be included in an effective vendor audit program?
- 1.1.13 What reinspection or reaudit frequency is appropriate to maintain confidence in those vendors on a qualified vendor list?
- 1.1.14 How do licensees ensure that Code Certificate holders and "N" stamp vendors are current?

- 1.1.15 Is there an auditable method to demonstrate that licensees actually purchased the product from a qualified vendor, for example, the holder of an ASME Code stamp holder certification?
- 1.1.16a Should negative inspection, testing and audit results be shared with other parties?
- 1.1.16b Is a Federal requirement necessary to permit this sharing of information?
- 1.1.16c Should procurement contracts be required to include a provision for public release of the results of audits of the vendor?
- 1.1.16d Are there restraint of trade, antitrust concerns or liabilities associated with these actions?
- 1.1.17 Should licensees, contractors and subcontractors be encouraged to make joint procurements and to share inspection/audit results of joint procurements to enhance the effectiveness of inspections/audits?
- 1.1.18 If joint procurements and inspections/audits are encouraged, should controls be imposed and, if so, what and how should these controls be imposed?

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- 1.1.19 What audit and testing documentation should be required to provide traceability and give confidence to all participants in joint product acceptances?
- 1.1.20a Should the NRC establish and publish a list of approved vendors for various products?
- 1.1.20b If a list of approved vendors is established, how should vendors be selected?
- 1.1.20c If a list of approved vendors is established, who should be responsible for maintaining this list?
- 1.1.20d Should licensees be restricted to making procurements from this list of approved vendors?
- 1.1.21 Should the use of a certificate, such as a Certificate of Conformance, in the procurement process be prohibited or, if allowed, be restricted to issue by the original equipment manufacturer for items that have remained under his direct control?
- 1.1.22 Should the furnishing of the original manufacturer's certificate, such as a Certified Material Test Report, be made mandatory for procurement of materials from intermediate vendors?

- 1.1.23 Should the transcribing of an original manufacturer's test data by intermediate vendors onto the vendors certification, for example, Certified Material Test Report, be forbidden?
- 1.1.24 To what extent should licensees or their representatives be required to inspect the implementation of contractor product acceptance programs?
- 1.1.25 Should licensees be required to audit implementation of 10 CFR Part 21 by suppliers and vendors?
- 1.1.26 In addition to the requirements of 10 CFR Part 21, should licensees be required to notify manufacturers, suppliers and vendors of licensee-identified problems with vendor-provided nonconforming products or programs?
- 1.1.27 Should licensee participation in a national data system for reporting equipment/component failures by manufacturer and application be required?
- 1.1.28 Is there specific data that should be included in a national data system that would significantly enhance its usefulness in establishing equipment performance history?

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1.1.29 What are the implications of any new Commission requirements on the Commission's endorsement of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code in 10 CFR 50.55a?

1.1.30 What is the best way to coordinate any new requirements with the ASME Boiler and Pressure Vessel Code?

1.1.31 Should the new requirements that relate to areas covered by the ASME Boiler and Pressure Vessel Code (e.g., SA material specifications) be handled through the code committee system?

1.1.32 To what extent should items 1.1.1a through 1.1.31 be required for other than safety-related components?

1.2 Metallic Products (e.g., fasteners, piping, pipe fittings, weld rod, castings, forgings, bar stock, plate material, stampings, wire, cable, etc.)

1.2.1a Should chemical analyses of the products be required as part of product acceptances?

1.2.1b Should these analyses of the products be performed by destructive or by nondestructive means?

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1.2.2a Should tests of mechanical properties (e.g., hardness, tensile strength, impact, etc.) of the products be required as part of product acceptances?

1.2.2b Should tests of mechanical properties of the products be performed by destructive or by nondestructive means?

1.2.3 When destructive tests are required, are test coupons (when applicable) an acceptable source of test materials for the tests of chemical and mechanical properties or should material samples be removed from actual products?

1.3 Nonmetallic Products (e.g., lubricants, tape, elastomers, seals, paints, filters, etc.)

1.3.1a Should chemical analyses be required for lubricants, tape, elastomers, etc., during product acceptances?

1.3.1b Should these analyses be performed by destructive or by nondestructive means?

1.3.2 Should physical property tests (e.g., viscosity for lubricants, hardness for elastomers, efficiency for filters, etc.) be required during product acceptances?

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1.4 Components (e.g., pumps, valves, circuit breakers, controllers and electronic parts/assemblies and their replacement parts)

1.4.1 Should components be subjected to functional tests during product acceptance?

1.4.2a Should components be disassembled, if necessary during product acceptance, to verify dimensional characteristics?

1.4.2b If the components are not disassembled, what methods should be utilized to verify critical characteristics?

1.4.3a Should the chemical and physical properties of component materials be analyzed during product acceptance inspections?

1.4.3b If the chemical and physical properties of component materials are to be analyzed during product acceptance inspections, what means should be utilized?

## 2. Dedication of Commercial Grade Products for Use in Safety-Related Structure, System and Component Applications

The questions in this section are categorized in five subsections: General, Metallic Products, Nonmetallic Products, Components, and Others Questions.

## 2.1 General

2.1.1 Should the Commission establish specific requirements or performance-based requirements to ensure that commercial grade products being dedicated for use in safety-related nuclear power plant structures, systems and components satisfy the operational requirements necessary to protect public health and safety?

2.1.2 Should NRC regulations be revised to endorse and incorporate by reference, the industry codes, standards, or guidance documents for dedication programs of commercial grade products for use in safety-related structure, system and component applications?

2.1.3a What should the traceability requirements be for all commercial products being upgraded for use in safety-related structures, systems and components?

2.1.3b If upgrading traceability provisions are necessary, what should these provisions include?

2.1.3c Should material traceability through all intermediary contractors, subcontractors and processors be required?

- 2.1.3d If item traceability is necessary, should there be any provisions for upgrading products whose traceability cannot be established?



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- 2.1.3e Should the upgrading traceability provisions be any different if the products are heat/lot identified or not?
- 2.1.3f What should the identification requirements be for traceability, for example, marking, bagging and records?
- 2.1.4 How should products intended for use in applications in which products are normally required to meet specific standards be inspected to verify that all critical characteristics are satisfied?
- 2.1.5 Should the shelf life of appropriate types of products be inspected and verified as acceptable as part of the upgrade inspection process?
- 2.1.6 What types of shelf life controls should be imposed on products that are being upgraded for use in safety-related structures, systems and components?
- 2.1.7 Should all upgrade inspections be restricted to inspections and tests or should they include, on a sample basis, destructive inspections and tests to verify chemical and physical characteristics?
- 2.1.8 What types of inspections and tests (appropriate for the various types of products) should be required?

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2.1.9 How should inspections verify all critical characteristics (for example, chemistry, physical properties, dimensions, special processes, etc.)?

2.1.10a If destructive inspections and tests are determined to be necessary, how should samples be selected if products are heat/lot identified?

2.1.10b How should samples be selected if products are not heat/lot identified?

2.1.11 Should sample plan testing be permitted for nondestructive testing or should such testing be on a 100 percent basis?

2.1.12 What criteria are appropriate for allowing sample plan testing during upgrade inspections?

## 2.2 Metallic Products

2.2.1a Are chemical analyses of the products appropriate as part of upgrade inspections?

2.2.1b Should these analyses be performed by destructive or by non-destructive means?

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- 2.2.2a Are tests of mechanical properties (e.g., hardness, tensile strength, impact, etc.) appropriate as part of upgrade inspections?
- 2.2.2b Should these tests be performed by destructive or by non-destructive means?
- 2.2.3 If the product is heat/lot traceable, is sample inspection (destructive and nondestructive) adequate for confirmation of critical characteristics?
- 2.2.4 If the product is not heat/lot traceable, is it necessary to either sample or 100 percent test, for example, hardness, to establish uniformity and then destructively analyze them (for example, chemical analyses, tensile tested, impact tested, etc.) to determine acceptability?
- 2.2.5 Should requirements in addition to those included in industry standards (e.g., additional samples, etc.) be required?
- 2.2.6 When destructive tests are required, are test coupons (when available) an acceptable source of test materials for chemical and mechanical properties tests or should material samples be removed from actual products?

## 2.3 Nonmetallic Products

2.3.1a Are chemical analyses necessary to establish critical characteristics for lubricants, tape, elastomers, etc., proposed for upgrading for use in safety-related systems?

2.3.1b Should these analyses be performed by destructive or by non-destructive means?

2.3.2 Are physical property tests (e.g., viscosity for lubricants, hardness for elastomers, efficiency for filters, etc.) necessary for upgrading these products?

2.3.3 May critical characteristics be inspected by samples or is 100 percent inspection necessary to verify these characteristics?

## 2.4 Components

2.4.1 Must each critical characteristic be inspected before the component is acceptable for use in safety-related systems?

2.4.2 How should the chemical and physical properties of component materials be analyzed during upgrade inspections?

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2.4.3 If critical characteristics cannot be inspected on each component piece, should it be acceptable to establish heat/lot traceability, establish uniformity of lot by sample inspection and thereby accept the lot?

2.4.4a Must components be 100 percent functionally tested or may they be subjected to functional tests on a sampling basis?

2.4.4b If inspected by sample, what is the basis for performing only sample inspection?

2.4.5a Should disassembly of components be required to verify critical characteristics?

2.4.5b May verification of critical characteristics be done on a sampling basis or are 100 percent inspections necessary?

2.4.5c What is the basis for performing only sample inspections?

2.4.5d If components are not disassembled to verify dimensions, what methods can be utilized to verify dimensions?

## 2.5 Other Questions

2.5.1a Are there any other agency/organization standards or programs that should be adopted for use in upgrading commercial grade products for use in safety-related systems?

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2.5.1b Should these standards or programs be endorsed by NRC regulations?

2.5.2 Are there other alternatives that could provide the necessary assurances?

2.5.3 To what extent should any existing controls or any additional controls being contemplated in the ANPR be extended to nonsafety-related applications in "balance of plant" structures, systems and components?

#### LIST OF SUBJECTS IN 10 CFR PART 50

Antitrust, Classified information, Fire protection, Incorporation by reference, Intergovernmental relations, Nuclear power plants and reactors, Penalty, Radiation protection, Reactor siting criteria, and Reporting and recordkeeping requirements.

The authority citations for this document are Sec. 161, Pub. L. 83-703, 68 Stat. 948, as amended (42 U.S.C. 2201); and Sec. 201, Pub. L. 93-438, 88 Stat. 1242, as amended (42 U.S.C. 5841).

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Dated at Rockville, Maryland, this            day of            1989.

FOR THE NUCLEAR REGULATORY COMMISSION

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Samuel J. Chilk,  
Secretary of the Commission

Enclosure 2

LIST OF REFERENCED NRC BULLETINS AND INFORMATION NOTICES

1. NRC Compliance Bulletin No. 87-02 and Supplements 1 and 2: "Fastener Testing to Determine Conformance With Applicable Material Specifications."
2. NRC Bulletin No. 88-05 and Supplements 1 and 2: "Nonconforming Materials Supplied by Piping Supplies, Inc. at Folsom, New Jersey and West Jersey Manufacturing Company at Williamstown, New Jersey."
3. NRC Bulletin No. 88-10: "Nonconforming Molded-Case Circuit Breakers."
4. NRC Information Notice 88-19: "Questionable Certification of Class 1E Components."
5. NRC Information Notice No. 88-35: "Inadequate Licensee Performed Vendor Audits."
6. NRC Information Notice No. 88-46 and Supplement 1: "Licensee Report of Defective Refurbished Circuit Breakers."
7. NRC Information Notice No. 88-48: "Licensee Report of Defective Refurbished Valves."
8. NRC Information Notice No. 88-97: "Potentially Substandard Valve Replacement Parts."



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

November 6, 1987

NRC COMPLIANCE BULLETIN NO. 87-02: FASTENER TESTING TO DETERMINE CONFORMANCE  
WITH APPLICABLE MATERIAL SPECIFICATIONS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

The purpose of this bulletin is to request that licensees 1) review their receipt inspection requirements and internal controls for fasteners and 2) independently determine, through testing, whether fasteners (studs, bolts, cap screws and nuts) in stores at their facilities meet required mechanical and chemical specification requirements.

Description of Circumstances:

Over the past year, some NRC procurement inspections have included the collection and testing of a small sample of fasteners. This limited program was initiated in response to a concern by the Industrial Fastener Institute over the potential use of inferior fasteners in military and industrial applications, including nuclear power plants. The results of NRC testing of fasteners obtained from San Onofre, Palo Verde and Rancho Seco indicates that 11 out of the 32 fasteners tested do not meet specification requirements for mechanical and/or chemical properties. Nine of the nonconforming bolts from Palo Verde and San Onofre were out of specification based on chemistry. Five nonconforming bolts came from Palo Verde and were all marked as SAE Grade 8 but were actually found to be SAE Grade 8.2. The four nonconforming fasteners from San Onofre were slightly out of specification for nickel or chromium. Two bolts from Rancho Seco with ASTM A193 B7 head markings were determined to have an average ultimate tensile strength of approximately 55 ksi instead of the specified 125 ksi for ASTM A193 B7 bolting material. The chemical analysis of these bolts indicated that they were medium carbon steel material. Rancho Seco is still investigating the extent and safety significance of these substandard fasteners.

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In a separate effort, Calvert Cliffs recently tested 1539 fasteners following their discovery that commercial grade fasteners had been used in safety-related applications. The test results indicated that 399 failed to meet specification requirements for mechanical and/or chemical properties. Based on evaluations performed by Calvert Cliffs, the fasteners which did not meet specification would have still fulfilled their safety function.

Actions to be Taken:

The results of the limited testing described above have demonstrated the need to obtain additional information on the adequacy of fasteners used in nuclear power plants.

Within 60 days from the receipt of this bulletin, licensees are requested to provide the following information concerning their receipt inspection and internal control procedures for fasteners and the results of independent testing of fasteners:

1. Describe a) the characteristics currently examined during receipt inspection of fasteners (i.e., head markings for grade and manufacturer symbols, review of certified material test report or certificate of conformance), and b) internal controls utilized during storage and issuance from stock to assure the appropriate use of fasteners.
2. Select a minimum sample of ten (10) non-safety related fasteners (studs, bolts, and/or cap screws), and ten (10) safety-related fasteners (studs, bolts, and/or cap screws) from current, in use, stock. The sample is to be obtained by the licensee with the participation of an NRC inspector. Fasteners procured to meet the following chemical and mechanical properties are of interest: A-193 grades B7, B8, and B16; SAE J429 grades 5 and 8; A-449; A-325 Types 1,2 or 3; A-354 grades BB, BC, BD; A-490; A-320 LHM; A-307; A-563; or equivalent.
3. For the selected sample of fasteners in item 2, include a sample of typical nuts that would be used with each fastener (one-for-one). In particular, nuts purchased to the chemical and mechanical specifications of A-194 are of interest.
4. Chemical testing shall be performed on all samples. Mechanical testing shall be performed on each safety-related fastener. Hardness testing shall be performed on each nut and non-safety-related fastener. All testing shall be performed by a laboratory which the licensee has qualified for this type of testing and appears on the licensee's approved vendor list. Testing performed shall be done in accordance with the requirements of the fastener's specification, grade, and class, and the test shall evaluate the ultimate tensile strength, hardness and chemical properties as required by the fastener's specification, grade, and class. Each sample shall be tagged with the sample's ID number.

5. The results of all tests, together with supporting information, are to be reported to the NRC utilizing the format shown in Attachments 1 and 2 of this bulletin. Include the names and addresses of suppliers and manufacturers of safety-related fasteners and, to the extent possible, of non-safety-related fasteners. For any fastener found out of specification, provide an evaluation of the safety significance including consideration of the most limiting application.
6. Based on the results of the testing and review of current procedures, describe any further actions being taken to assure that fasteners used in the plant meet the requisite specifications and requirements and that the operability of safety-related plant components is not affected.

The written reports shall be submitted to the appropriate Regional Administrator under oath or affirmation under provisions of Section 182a, Atomic Energy Act of 1954, as amended. Also, the original copy of the cover letters and a copy of the reports shall be transmitted to the U.S. Nuclear Regulatory Commission, Document Control Desk, Washington, D.C., 20555 for reproduction and distribution.

This request for information was approved by the Office of Management and Budget under a blanket clearance number 31500011. Comments on burden and duplication may be directed to the Office of Management and Budget, Reports Management, Room 3208, New Executive Office Building, Washington, D.C., 20503.

If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

*Charles E. Rossi*  
Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: J. T. Conway, NRR  
(301) 492-9740

E. T. Baker, NRR  
(301) 492-4783

J. C. Harper, NRR  
(301) 492-4143

**Attachments:**

1. Fastener Testing Data Sheet
2. Data Summary
3. List of Recently Issued Bulletins

Attachment 1

Fastener Testing Data Sheet

\*Sample ID\*

Fastener Description:

Description of Sample Stock Location:

Material Specification as Documented by Licensee Records:

Head Marking (Specification and Manufacturer):

\*\*Class/Procurement Level:

General Plant Application (e.g., Pressure Boundary, Structural)

Vendor:

QA Requirements Imposed on Vendor:

Licensee Representative:

Signature \_\_\_\_\_ Date \_\_\_\_\_

\*The sample ID# shall have a prefix that contains the licensee facility initials.

\*\*If applicable, please provide an explanation for your classification system.

Attachment 2

Data Summary

<u>Mechanical Analysis</u>			<u>Chemical Analysis</u> <sup>1</sup>							
<u>ID#</u>	<u>Hardness</u>	<u>UTS</u>	<u>0.2% YS</u>	<u>C</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Si</u>	<u>Mo</u>	<u>Cr</u>

Note: UTS-ultimate tensile strength; YS-yield strength; C-carbon; Mn-Manganese; P-Phosphorous; S-Sulfur; Si-Silicon; Mo-Molybdenum; Cr - Chromium.

<sup>1</sup>The elements listed apply to ASTM A193 B7 or SA193 B7 material. The elements to be reported for other materials tested, shall conform to those reported in the applicable material specification. Properties found out of specification shall be noted with an asterisk.

LIST OF RECENTLY ISSUED  
BULLETINS

Bulletin No.	Subject	Date of Issuance	Issued to
87-01	Thinning of Pipe Walls in Nuclear Power Plants	7/9/87	All licensees for nuclear power plants holding an OL or CP.
86-04	Defective Teletherapy Timer that May Not Terminate Dose	10/29/86	All NRC licensees authorized to use cobalt-60 teletherapy units.
86-03	Potential Failure of Multiple ECCS Pumps Due to Single Failure of Air-Operated Valve in Minimum Flow Recirculation Line	10/8/86	All facilities holding an OL or CP.
86-02	Static "O" Ring Differential Pressure Switches	7/18/86	All power reactor facilities holding an OL or CP.
86-01	Minimum Flow Logic Problems That Could Disable RHR Pumps	5/23/86	All GE BWR facilities holding an OL or CP.
85-03	Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings	11/15/85	All power reactor facilities holding an OL or CP.
85-02	Undervoltage Trip Attachments of Westinghouse DB-50 Type Reactor Trip Breakers	11/5/85	All power reactor facilities holding an OL or CP.
85-01	Steam Binding of Auxiliary Feedwater Pumps	10/29/85	Nuclear power facilities and CPs listed in Attachment 1 for action; all other nuclear power facilities for information.

OL = Operating License  
CP = Construction Permit

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

April 22, 1988

NRC BULLETIN NO. 87-02, SUPPLEMENT 1: FASTENER TESTING TO DETERMINE  
CONFORMANCE WITH APPLICABLE  
MATERIAL SPECIFICATIONS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

The purpose of this supplement is to require addressees to submit additional information on the source of fasteners purchased for use in nuclear power plants.

Description of Circumstances:

Item 5 of NRC Compliance Bulletin 87-02 requested that all holders of operating licenses or construction permits for nuclear power reactors submit information regarding the identity of the suppliers and manufacturers of the safety-related and non-safety-related fasteners selected for testing. After further consideration, the NRC has determined that it needs information regarding the identity of all vendors from which safety-related and non-safety-related fasteners have been obtained within the past 10 years, a reasonable period which will not put undue burden on addressees. This information will assist the NRC in determining whether nuclear facility fasteners in use have been supplied in accordance with their intended use. In addition, this information is needed so that the NRC can properly coordinate information with other government agencies concerned with problems identified in the quality of fasteners.

Action Required:

Within 90 days from the receipt of this supplemental bulletin, addressees shall provide the following information concerning the procurement of fasteners within the past 10 years:

1. A list of the suppliers and manufacturers from which safety-related fasteners have been purchased, including addresses, and the type of fasteners purchased (i.e., the material specifications). For those fastener purchases made from fastener suppliers and/or original equipment manufacturers, any available information concerning the manufacturer or sub-tier supplier of the fastener also should be provided.

2. For non-safety-related fasteners the same information as requested in item 1.

The written reports requested above shall be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, under oath or affirmation under the provisions of Section 182a, Atomic Energy Act of 1954, as amended. In addition, a copy shall be submitted to the appropriate Regional Administrator.

This requirement for information was approved by the Office of Management and Budget under a blanket clearance number 3150-0011. Comments on burden and duplication may be directed to the Office of Management and Budget, Reports Management, Room 3208, New Executive Office Building, Washington, D.C. 20503.

If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

*Charles E. Rossi*  
Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: J. T. Conway, NRP  
(301) 492-0978

E. T. Baker, NRR  
(301) 492-3221

Attachment: List of Recently Issued NPC Bulletins



LIST OF RECENTLY ISSUED  
NRC BULLETINS

Bulletin No.	Subject	Date of Issuance	Issued to
88-03	Inadequate Latch Engagement in HFA Type Latching Relays Manufactured by General Electric (GE) Company	3/10/88	All holders of OLs or CPs for nuclear power reactors.
88-02	Rapidly Propagating Fatigue Cracks in Steam Generator Tubes	2/5/88	All holders of OLs or CPs for W-designed nuclear power reactors with steam generators having carbon steel support plates.
88-01	Defects in Westinghouse Circuit Breakers	2/5/88	All holders of OLs or CPs for nuclear power reactors.
87-02	Fastener Testing to Determine Conformance with Applicable Material Specifications	11/6/87	All holders of OLs or CPs for nuclear power reactors.
87-01	Thinning of Pipe Walls in Nuclear Power Plants	7/9/87	All licensees for nuclear power plants holding an OL or CP.
86-04	Defective Teletherapy Timer That May Not Terminate Dose	10/29/86	All NRC licensees authorized to use cobalt-60 teletherapy units.
86-03	Potential Failure of Multiple ECCS Pumps Due to Single Failure of Air-Operated Valve in Minimum Flow Recirculation Line	10/8/86	All facilities holding an OL or CP.
86-02	Static "O" Ring Differential Pressure Switches	7/18/86	All power reactor facilities holding an OL or CP.
86-01	Minimum Flow Logic Problems That Could Disable RHR Pumps	5/23/86	All GE BWR facilities holding an OL or CP.

OL = Operating License  
CP = Construction Permit

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

June 10, 1988

NRC BULLETIN NO. 87-02, SUPPLEMENT 2: FASTENER TESTING TO DETERMINE  
CONFORMANCE WITH APPLICABLE  
MATERIAL SPECIFICATIONS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

The purpose of this supplement is to clarify the type of information addressees were required to submit in response to Bulletin 87-02, Supplement 1 on the source of fasteners purchased for use in nuclear power plants.

Discussion:

The "action required" statement of Supplement 1 is revised in its entirety to clarify that the intent of Supplement 1 was to require addressees to provide a list of suppliers and manufacturers from which fasteners may have been purchased. Licensees are not required to contact subcontractors to obtain the requested information, nor are they required to submit data on fasteners supplied as part of an original component. The type of fasteners for which vendor/supplier names and addresses are requested is limited to ferrous fasteners 1/4 inch in diameter or greater.

Action Required:

Within 90 days from the receipt of Supplement 1 to Bulletin 87-02 (issued on April 22, 1988), addressees shall provide the following information concerning the procurement of fasteners:

1. A list of the suppliers and manufacturers from which safety-related ferrous fasteners 1/4 inch in diameter or greater may have been purchased, within the past 10 years, including addresses. For those fasteners purchased from fastener suppliers and/or original equipment manufacturers, any available information that identifies the manufacturer or sub-tier supplier of the

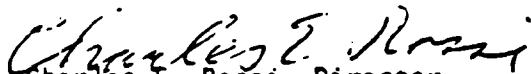
fasteners also should be provided. Approved Vendor List or Qualified Supplier Lists are the intended sources for this information. Addressees are not required to search purchase order files, contact subcontractors to obtain the information, or submit data on fasteners supplied as part of an original component.

2. For nonsafety-related fasteners the same information as requested in the first two sentences of item 1, above, except that a) the time of interest is for fasteners procured in the last 5 years, and b) the search of available records in this case should include purchase orders unless the licensee utilizes approved vendor lists or qualified supplier lists in procuring nonsafety-related fasteners. This information collection is understood to be on a best-effort basis. Further, addressees are not required to contact subcontractors to obtain the information or to submit data on fasteners supplied as part of an original component.

The written reports requested above shall be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, under oath or affirmation under the provisions of Section 182a, Atomic Energy Act of 1954, as amended. In addition, a copy shall be submitted to the appropriate Regional Administrator.

This requirement for information was approved by the Office of Management and Budget under a blanket clearance number 3150-0011. Comments on burden and duplication may be directed to the Office of Management and Budget, Reports Management, Room 3208, New Executive Office Building, Washington, D.C., 20503.

If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

  
Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: J. T. Conway, NRR  
(301) 492-0978

E. T. Baker, NRR  
(301) 492-3221

Attachment: List of Recently Issued NRC Bulletins

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

May 6, 1988

NRC BULLETIN NO. 88-05: NONCONFORMING MATERIALS SUPPLIED BY PIPING  
SUPPLIES, INC. AT FOLSOM, NEW JERSEY AND WEST  
JERSEY MANUFACTURING COMPANY AT WILLIAMSTOWN,  
NEW JERSEY

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

The purpose of this bulletin is to require that licensees submit information regarding materials supplied by Piping Supplies, Incorporated (PSI) at Folsom, New Jersey and West Jersey Manufacturing Company (WJM) at Williamstown, New Jersey and to request that licensees 1) take actions to assure that materials comply with ASME Code and design specification requirements or are suitable for their intended service, or 2) replace such materials.

Description of Circumstances:

The NRC has obtained copies of certified material test reports (CMTRs) for material supplied by PSI and WJM that contain false information about material supplied to the nuclear industry. A number of CMTRs were apparently used to certify that commercial-grade, foreign steel meets the requirements of ASME Code Section III, Subarticle NCA-3800, by using a domestic forging company's letterhead. There was no evidence that PSI or WJM performed or had a subcontractor perform the testing required by Section III to upgrade the commercially produced steel for these falsified CMTRs. The information available to date indicates that WJM started supplying ASME Code components to the nuclear industry in 1976, both directly as well as through intermediaries, and that PSI started supplying ASME Code components to the nuclear industry directly and through intermediaries in 1985. In addition, WJM held an ASME Quality System Certificate (QSC-385) as a material manufacturer from November 30, 1979 to November 30, 1985.

The NRC has concluded that there are potential generic safety implications at facilities that either have received direct shipment of materials furnished by PSI or WJM (i.e., pipe fittings and flanges) or received piping subassemblies and other components from holders of ASME Certificates of Authorization or other subcontractors which incorporated materials supplied by PSI or WJM.

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Actions Requested:

1. Review purchasing records for your facility and determine whether any WJM- or PSI-supplied ASME Code or ASTM materials have been furnished to your facility. The lists of purchasing and receiving companies given in Attachments 1 and 2 have been developed through the NRC's partial review of PSI and WJM documents. It is emphasized that the NRC has not reviewed all documents; therefore, the review of records should not be limited to the companies on these lists. The records review for PSI-supplied material should cover the period since January 1, 1985. The WJM review should cover the period since January 1, 1976.
2. For ASME Code and ASTM materials furnished by PSI or WJM that are either not yet installed in safety-related systems at your facility or are installed in safety-related systems of plants under construction, the following actions are requested: (perform action a and either action b or c)
  - a. Provide a list of WJM- and PSI-supplied materials that are found not to be in conformance with the applicable code requirements or procurement specifications and identify the applications in which these materials are used or will be used. Include the material specification, the nature of the component (e.g., pipe flange), size and pressure rating; also indicate the chain of purchase, and either
  - b. Take actions that provide assurance that all received materials comply with ASME Code Section III, ASTM, and applicable procurement specification requirements, or that demonstrate that such materials are suitable for the intended service. For example, this program should include specific verification that austenitic stainless steels have been received in a non-sensitized condition, or,
  - c. Replace all questionable fittings and flanges with materials that have been manufactured in full compliance with ASME Code Section III, ASTM, and the applicable procurement specification requirements.
3. For ASME Code and ASTM materials furnished by WJM or PSI already installed in safety-related systems in operating plants, the following actions are requested:
  - a. Provide a list of the WJM- and PSI-supplied materials that are found not to be in conformance with the applicable code requirements or procurement specifications and identify the applications in which the materials are used. Include the material specification, the nature of the component (e.g., pipe flange), size, and pressure rating; also indicate the chain of purchase.
  - b. Take actions requested in 2b or 2c above. However, an evaluation should be undertaken prior to replacing questionable material in accordance with 2c above that considers the occupational radiation

exposure that would be received during the replacement process. This evaluation should be considered in developing the method and timing of material replacements.

- c. Document and maintain for inspection a basis for continued plant operation if the program requested in item 3b has not been completed within 120 days of the date of receipt of this bulletin.
4. For any PSI- or WJM-supplied materials having suspect CMTRs and used in systems that are not safety-related, take actions commensurate with the function to be performed.
5. Maintain for inspection the documentation of the specific actions taken for the identified materials.
6. For operating plants, all scheduled actions should be completed before a restart from the next major outage starting after 180 days from the date of receipt of this bulletin. For plants under construction all scheduled actions and the reporting required by 2 below should be completed prior to the planned fuel load date. If any addressee cannot meet this schedule, they should justify to the NRC their proposed alternative schedule.

Reporting Requirements:

1. Provide a written report within 120 days of the date of receipt of this bulletin that either:
  - a. States that no WJM- or PSI-supplied materials have been furnished for your facility for use in safety-related systems, if such is the case, or
  - b. Provides the information requested in items 2a and 3a above that indicates which materials have been found not to be in conformance with the applicable code requirements or procurement specifications, confirms completion of other actions requested in items 2b or c, 3b and 4, and provides a schedule for completing any remaining actions.
2. Confirmation of completion of all scheduled actions shall be submitted to the NRC within 60 days of completion for operating plants and prior to the fuel load date for plants under construction.

The written reports, required above, shall be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, under oath or affirmation under the provisions of Section 182a, Atomic Energy Act of 1954, as amended. In addition, a copy shall be submitted to the appropriate Regional Administrator.

This requirement for information was approved by the Office of Management and Budget under clearance number 3150-0011.

If you have any questions regarding this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate NRC Regional Office.

*Charles E. Rossi*  
Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: Ray Cillimberg, NRR  
(301) 492-3220

Ed Baker, NRR  
(301) 492-3221

Attachments:

1. Table 1 - Known and Intended Recipients of Carbon Steel Materials  
furnished by PSI or WJM
2. Table 2 - Known and Intended Recipients of Stainless Steel Materials  
furnished by PSI or WJM
3. List of Recently Issued NRC Bulletins

TABLE 1 - KNOWN AND INTENDED RECIPIENTS OF CARBON STEEL  
 MATERIALS FURNISHED BY PSI AND WJM

<u>Purchaser</u>	<u>Receiving Company</u>	<u>Nuclear Plant (if known)</u>
Radnor Alloys, Inc.	Bechtel Power Corp.	Pilgrim
Capitol Pipe & Steel	Bechtel Power Corp.	Midland
Pullman Power Products	Pullman Power Products	Palo Verde
Pullman Power Products	Daniel	Wolf Creek
Pullman Power Products	Cleveland Electric	Perry
Pullman Power Products	Bechtel Power Corp.	South Texas
Pullman Power Products	Pullman Power	San Onofre
Pullman Power Products	Pullman Power	Vogtle
Tyler Davison	Bechtel Power Corp.	Grand Gulf
Osborne Brothers Welding Supply	General Electric	Perry
HUB Incorporated	Duke Power	Oconee
HUB Incorporated	Bechtel Power Corp.	Arkansas
HUB Incorporated	Bechtel Power Corp.	WNP-2
Chicago Tube & Iron	Omaha Public Power District	Fort Calhoun
Chicago Tube & Iron	Commonwealth Edison	Braidwood
Chicago Tube & Iron	Cherne Construction Co.	Marble Hill
Chicago Tube & Iron	Northern States Power	-----
Chicago Tube & Iron	Consumer Power	Palisades
Dravo Corp.	Dravo Corp.	Seabrook
Joliet Valves, Inc.	Joliet Valves, Inc.	-----
McJunkin	Bechtel Power Corp.	San Onofre
Guyon Alloys	Babcock & Wilcox	-----
ITT Grinnell	ITT Grinnell	-----
Guyon Alloys, Inc.	Bechtel Power Corp.	Limerick
Guyon Alloys, Inc.	Northeast Nuclear Energy Company	Millstone
Guyon Alloys, Inc.	Bechtel c/o PP&L	Susquehanna
Guyon Alloys, Inc.	Duke Power	Catawba
Guyon Alloys, Inc.	Bechtel Power Corp.	Hope Creek
Guyon Alloys, Inc.		WNP-2
Guyon Alloys, Inc.	Carolina Power & Light	Brunswick
Guyon Alloys, Inc.	Baldwin Associates	Clinton
Guyon Alloys, Inc.	South Carolina Electric and Gas	V.C. Summer
Guyon Alloys, Inc.	Carolina Power & Light	Shearon Harris
Guyon Alloys, Inc.	Gulf States	River Bend
Bellows		-----
American Standard	American Standard	-----
Louis P. Canuso	Bechtel/Public Service	Hope Creek



TABLE 1 - KNOWN AND INTENDED RECIPIENTS OF CARBON STEEL  
 MATERIALS FURNISHED BY PSI AND WJM  
 (continued)

<u>Purchaser</u>	<u>Receiving Company</u>	<u>Nuclear Plant (if known)</u>
Capitol Pipe & Steel	Bechtel	Hope Creek
Gulfalloy	Bechtel Power Corp.	Palo Verde
Public Service Electric and Gas	PSE&G	Salem
Conax	Conax	-----
Consolidated Power*	Bechtel Power	South Texas
Consolidated Power*	Duke Power	McGuire
Consolidated Power*	Boston Edison	Pilgrim
Consolidated Power*	Niagara Mohawk	Nine Mile Point
Consolidated Power*	Philadelphia Electric	Limerick
Louis P. Canuso	Bechtel Corp.	Hope Creek
Dubose	Toledo Edison	Davis-Besse
Dubose	Florida Power	Crystal River
Dubose	TVA	Sequoyah
Dubose	TVA	Watts Bar
Dubose	PP&L	Susquehanna
Dubose	SMUD	Rancho Seco
Dubose	Rochester Gas & Electric	Ginna
Dubose	Duke Power	Oconee
Dubose	Power Authority State of N.Y.	FitzPatrick
Dubose	South Carolina Electric and Gas	-----

\*Consolidated Power is also known as Consolidated Piping and Supply located  
 in Birmingham, Alabama, Furlong, Pa., and Charlotte, N.C.

TABLE 2 - KNOWN AND INTENDED RECIPIENTS OF STAINLESS STEEL  
MATERIALS FURNISHED BY PSI AND WJM

<u>Purchaser</u>	<u>Receiving Company</u>	<u>Nuclear Plant (if known)</u>
HUB Incorporated	Bechtel Power Corp.	Limerick
Radnor Alloys	Radnor Alloys	-----
Pullman Power Products	Pullman Power	-----
Dravo Corp.	Dravo Corp.	Seabrook
Louis P. Canuso, Inc.	Philadelphia Electric	Peach Bottom
L. P. Canuso, Inc.	Bechtel Power Corp.	-----

LIST OF RECENTLY ISSUED  
NRC BULLETINS

Bulletin No.	Subject	Date of Issuance	Issued to
88-04	Potential Safety-Related Pump Loss	5/5/88	All holders of OLs or CPs for nuclear power reactors.
85-03, Supplement 1	Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings	4/27/88	All holders of OLs or CPs for BWRs.
87-02, Supplement 1	Fastener Testing to Determine Conformance with Applicable Material Specifications	4/22/88	All holders of OLs or CPs for nuclear power reactors.
88-03	Inadequate Latch Engagement in HFA Type Latching Relays Manufactured by General Electric (GE) Company	3/10/88	All holders of OLs or CPs for nuclear power reactors.
88-02	Rapidly Propagating Fatigue Cracks in Steam Generator Tubes	2/5/88	All holders of OLs or CPs for W-designed nuclear power reactors with steam generators having carbon steel support plates.
88-01	Defects in Westinghouse Circuit Breakers	2/5/88	All holders of OLs or CPs for nuclear power reactors.
87-02	Fastener Testing to Determine Conformance with Applicable Material Specifications	11/6/87	All holders of OLs or CPs for nuclear power reactors.
87-01	Thinning of Pipe Walls in Nuclear Power Plants	7/9/87	All licensees for nuclear power plants holding an OL or CP.

OL = Operating License  
CP = Construction Permit

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

June 15, 1988

NRC BULLETIN NO. 88-05, SUPPLEMENT 1: NONCONFORMING MATERIALS SUPPLIED BY  
PIPING SUPPLIES, INC. AT FOLSOM, NEW  
JERSEY AND WEST JERSEY MANUFACTURING  
COMPANY AT WILLIAMSTOWN, NEW JERSEY

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

The purpose of this supplement is to 1) provide additional information concerning material supplied by Piping Supplies, Incorporated (PSI) and West Jersey Manufacturing Company (WJM), 2) reduce the scope of the requested materials review to only flanges and fittings, 3) delineate actions licensees are requested to take to identify these materials and to determine whether the materials comply with ASME and ASTM design and material specifications, and 4) clarify what actions licensees are requested to take once they identify material that does not comply with the above material specifications.

Description of Circumstances:

On June 10, 1988 the NRC staff was informed by Carolina Power & Light (CP&L) that the Shearon Harris Nuclear Plant had tested two flanges from their warehouse that had been supplied by WJM. The two flanges were identified as belonging to Heat No. 7218, SA-105 material. The CP&L test results did not match those reported on WJM's Certified Material Test Reports (CMTRs) and did not meet the tensile and yield strength requirements for SA-105 material. Required minimum tensile strength is 70 KSI whereas the measured tensile strengths were 45 KSI and 46 KSI. The tensile strength reported on the CMTR was 77 KSI. Required minimum yield strength is 36 KSI whereas the measured yield strengths were 27 KSI and 31 KSI. The yield strength reported on the CMTR was 50 KSI. Measured chemistry composition was also out of specification, notably percent carbon was very low at 0.045 and manganese was measured at 0.32 (required range 0.6 to 1.05).

Bulletin 88-05 requires that all PSI and WJM supplied material be identified and that a determination be made as to its suitability for the intended or

actual application. This supplement narrows the scope of review from ASME and ASTM "materials" to ASME and ASTM fittings and flanges. In view of the recent verification that flanges which do not comply with ASME and ASTM specifications have been supplied to the nuclear industry, the time frames for certain actions are also modified by this supplement.

Actions Requested:

The actions requested in Bulletin 88-05 remain in effect with the following additions:

1. Review of purchasing records may be reduced in scope from ASME and ASTM "materials" to ASME and ASTM "fittings and flanges" and the review should be initiated and completed promptly.<sup>1</sup>
2. The scope of paragraph 2 of Bulletin 88-05 is reduced from ASME and ASTM "materials" to ASME and ASTM "flanges and fittings." All other provisions of paragraph 2 of Bulletin 88-05 remain in effect.
3. The scope of paragraph 3 of Bulletin 88-05 is reduced from ASME and ASTM "materials" to ASME and ASTM "flanges and fittings." For ASME and ASTM flanges and fittings furnished by PSI or WJM already installed in safety-related systems in operating plants, the following actions are requested:
  - a. Commence appropriate testing of accessible flanges and fittings promptly to identify conformance of materials to ASME and ASTM material specifications. Test results for flanges and fittings reported to be from the same heat should be compared for consistency and for conformance to the ASME/ASTM specifications and to values listed on material CMTRs. Any deviation from the specification requires an appropriate analysis justifying continued operation.
  - b. If any inaccessible flanges or fittings are identified, an analysis must be performed justifying continued operation.
  - c. All other provisions of paragraph 3 of Bulletin 88-05 remain in effect.
4. For flanges and fittings already identified as having been supplied by PSI or WJM, the actions requested in 3a and 3b above are to be completed within 30 days of receipt of this supplement. For flanges and fittings identified after receipt of this supplement, the actions requested in 3a and 3b above are to be completed within 30 days of identifying the flanges or fittings as being supplied by PSI and WJM.

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<sup>1/</sup> Based on the discovery by CP&L of nonconforming flanges and on NRC review of records of WJM's production of numerous flanges purportedly from Heat No. 7218, licensees should specifically be alert to identify records for flanges from Heat No. 7218.

5. Addressees are requested to retain nonconforming materials until advised further by the NRC. Nonconforming materials should be segregated to ensure that they are not inadvertently used.
6. Addressees are encouraged to report the results of tests of PSI and WJM supplied flanges and fittings to the INPO Nuclear Network for dissemination to the industry.

Reporting Requirements:

The reporting requirements of Bulletin 88-05 remain in effect with the following additions:

1. The NRC Operations Center should be notified by telephone, 202-951-0550, of the need for analysis to justify continued operation as required in paragraphs 3a and 3b. Where the need for analysis to justify continued operation results in a requirement for a report under 10 CFR 50.72, the notification to the Operations Center should be in accordance with the reporting times required by 10 CFR 50.72. If the need for analysis to justify continued operation would not result in a requirement for a report under 10 CFR 50.72, the notification to the Operations Center should be made within 48 hours.
2. Include the results of all tests of PSI or WJM materials in the written response to Bulletin 88-05.

The written reports required above shall be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, under oath or affirmation under the provisions of Section 182a, Atomic Energy Act of 1954, as amended. In addition, a copy shall be submitted to the appropriate Regional Administrator.

This requirement for information was approved by the Office of Management and Budget under blanket clearance number 3150-0011. Comments on burden and duplications should be directed to the Office of Management and Budget, Reports Management, Room 3208, New Executive Office Building, Washington, D.C. 20503.

If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate NRC regional office.



Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: Ray Cilimberg, NRR  
(301) 492-3220

Ed Baker, NRR  
(301) 492-3221

Attachment: List of Recently Issued NRC Bulletins

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

August 3, 1988

NRC BULLETIN NO. 88-05, SUPPLEMENT 2: NONCONFORMING MATERIALS SUPPLIED BY  
PIPING SUPPLIES, INC. AT FOLSON, NEW  
JERSEY AND WEST JERSEY MANUFACTURING  
COMPANY AT WILLIAMSTOWN, NEW JERSEY

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

The purpose of this supplement is to (1) modify the schedule for actions addressees were requested to perform in Bulletin 88-05 and Supplement 1 and (2) provide additional information concerning materials supplied by Piping Supplies, Incorporated (PSI), West Jersey Manufacturing (WJM), and a recently identified affiliated company, Chews Landing Metal Manufacturers Incorporated (CLM).

Description of Circumstances:

On July 22, 1988, the NRC staff met with representatives of the Nuclear Management and Resources Council (NUMARC) to discuss the status of licensees' actions in response to Bulletin 88-05 and Supplement 1. During this meeting, NUMARC presented information on licensee and NUMARC/Electric Power Research Institute (EPRI) testing and evaluation methodology of PSI/WJM flanges. This information was summarized in a letter to the NRC from NUMARC dated July 25, 1988 and a detailed report and proposal was subsequently submitted on July 29, 1988 (Attachment 1).

Based on the reported measurement and analytical results to date, the NRC has concluded that for full power licensees it is appropriate to suspend, temporarily, the field measurements, testing, records review, and the preparation of justifications for continued operations (JCOs) that were requested by Bulletin 88-05 and Supplement 1 until further notice. Addressees that have not received a full power license are requested to continue the in-situ testing and the records review. The time frames of interest remain as specified in the original Bulletin, January 1, 1976 to present. During the temporary suspension of the requested activities, the NRC will review the measurement and test data and results of analysis performed and determine the extent to

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which further actions are appropriate to assure the continued safe operation of nuclear power plants. However, addressees should continue to analyze the test results performed to date.

On July 22, 1988, the NRC staff completed its review of PSI/WJM/CLM purchase order and invoice records. Based on this review, the staff has determined that PSI/WJM/CLM provided product forms in addition to flanges and fittings. The additional product forms are identified in Attachment 2 and a list of nuclear power plants that were identified as possible recipients of PSI/WJM/CLM materials is provided in Attachment 3. The NRC staff also identified Certified Material Test Reports (CMTRs) for ASME Section III materials from CLM, which also should be considered as suspect. CLM was owned by parties involved in PSI and WJM and the persons signing the CMTRs for CLM also signed the CMTRs for PSI and WJM. Attachment 4 provides a listing of additional intermediary suppliers/fabricators of PSI/WJM/CLM products. Bulletin 88-05 identified 1976 as the beginning date for suspect materials provided by PSI/WJM; however, information available to the NRC now indicates that WJM may have provided ASME materials as early as 1962. The NRC is providing the above information to assist the industry in their understanding of the PSI/WJM/CLM issue.

Actions Requested:

The actions requested in Bulletin 88-05 and Supplement 1 are temporarily suspended with the following exceptions:

1. Addressees that have not received a full power operating license are requested to continue the records review and the in-situ testing of installed flanges and fittings.
2. Addressees are requested to maintain for inspection the documentation of the specific actions taken for the identified materials.
3. Addressees are requested to retain nonconforming materials until advised further by the NRC.
4. Addressees are encouraged to report the results of tests of PSI and WJM supplied flanges and fittings to the INFC Nuclear Network for dissemination to the industry.

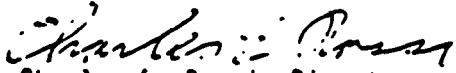
Reporting Requirements:

The reporting requirements of Bulletin 88-05 and Supplement 1 are temporarily suspended with the following exceptions:

1. Holders of full power operating licenses are required to report the results of their records review, testing, and analysis performed as of the date of this supplement in accordance with the 120 day reporting requirement specified in paragraph 1 of bulletin 88-05.
2. Holders of construction permits are required to report the results of the records review, testing, and analysis prior to the planned fuel load date.



If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate NRC regional office.

  
Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: Ray Cilimberg, NRR  
(301) 492-3220

Ed Baker, NRR  
(301) 492-3221

Attachments:

1. Ltr to NRC from HUMARC, dtd July 29, 1988
2. Product Forms Sold by WJM/PSI/Chews Landing
3. Nuclear Plants Receiving Suspect Material
4. Purchasers Receiving Suspect Material
5. List of Recently Issued NRC Bulletins



**NUCLEAR MANAGEMENT AND RESOURCES COUNCIL**

Attachment No. 1  
NRCB 88-05 Supplement 2  
August 3, 1988

July 29, 1988

Mr. Thomas T. Martin  
Associate Director for Inspection  
and Technical Assessment  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Dear Mr. Martin:

In a meeting held July 22 with NRC, NUMARC requested that utility activities relative to NRC Bulletin 88-05 and Supplement 1 be suspended. This suspension request was based on a generic analysis provided to NRC by NUMARC's letter of July 22. In the subject NRC meeting, NUMARC also presented an analysis of utility and laboratory test data obtained to date. NUMARC's letter of July 25 to Dr. Thomas Murley formalized the request for suspension. In that letter, NUMARC committed to provide a written report to NRC reflecting the test data and conclusions presented in the July 22 meeting, and providing quantitative statistical evaluations relative to the conclusions presented at this meeting. That report is hereby provided as an attachment.

As noted previously, the NUMARC laboratory testing program will be carried to completion even if utility test efforts are suspended. An update of the attached report will be provided addressing conclusion of the NUMARC laboratory testing program as well as inclusion of field test data not yet reflected.

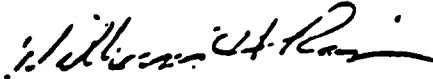
We would like to reiterate the importance of timely action in your consideration of NUMARC's request for suspension. Utility resource expenditures of major proportions are presently continuing without abatement. Continuation of testing is not resource effective and, as documented in the attachment, would not be expected to result in additional insights. Moreover, in conjunction with the generic analysis previously provided, the attachment substantiates that no significant public health and safety concern is represented by this issue.

Mr. Thomas T. Martin  
July 29, 1988  
Page 2

NUMARC is studying all available information to determine what industry action should be taken to come to final resolution of this issue. We will discuss our intentions with you and your staff in the near future.

If you or your staff have any questions, please do not hesitate to contact us at any time.

Sincerely,



William H. Rasin  
Director, Technical Division

WHR/reb  
Attachment

cc: Lawrence C. Shao  
Director, Division of Engineering and System Technology

D. J. McDonald  
Executive Director  
National Board of Boiler and Pressure Vessel Inspectors

**NUMARC GENERIC TESTING PROGRAM**

**RESPONSE TO NRC BULLETIN 88-05**

**INTERIM REPORT**

**July 29, 1988**

**Prepared By**

**Bechtel National, Inc.  
San Francisco, California 94105**

**Prepared For**

**Electric Power  
3412 Hillview Avenue  
Palo Alto, California 94203**

## ABSTRACT

The NRC Bulletin 88-05 addressed the alleged falsification of Certified Materials Test Reports (CMTRs) by two suppliers, WJM and PSI, of piping flanges and fittings. NUMARC, through the technical management of EPRI, developed a multifaceted program to assist utilities in addressing this bulletin. Laboratory testing of suspect material, the compilation of utility test data and analysis of that data are reported. These data show in general that, except for blind flanges, the suspect material meets tensile strength requirements and is satisfactory for ASME Code applications. The hardness testing results for the same materials exhibit a broad scatter band which would justify application of a testing tolerance band in comparison to the ASTM A370 conversion from hardness to tensile strength. The field and laboratory testing results both exhibit the same broad scatter band. A laboratory generated best fit curve is used to relate measured field hardness to tensile strength.

The field hardness test data for 1334 items show the same scatter band as found in laboratory tests, and follows the same general bell shape hardness distribution as laboratory hardness tests. The similarity in shapes and the lack of bumps at either the low ends or the high ends of these laboratory and field histograms indicates that there is not a concern for low strength material or high strength material. Applying a best fit approach from laboratory hardness and tensile data to field hardness data results in an estimate of strength. The best fit approach to the field data indicates that the vast majority are acceptable. Based on the laboratory testing and extensive field testing, it is concluded there is no materials problem, except possibly for some blind flanges.

Blind flanges and other components were addressed analytically in the NUMARC generic analysis report, and it was shown that in the majority of cases there would not be a stress concern even if strength in the order of 40 KSI were to be assumed.

This interim report concludes that the material has acceptable strength and except for some blind flanges is satisfactory for ASME Code applications. The continued use of these flanges and fittings does not present a safety problem.

Recommendations are made for follow-up activities.

NUMARC GENERIC TESTING PROGRAM  
RESPONSE TO NRC BULLETIN 88-05

INTERIM REPORT

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Figure 1	Histogram of Laboratory Tensile Results
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Figure 4	Histogram of Laboratory Hardness
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## INTRODUCTION

### BACKGROUND

The NRC issued Bulletin 88-05 regarding alleged falsification of Certified Materials Test Reports (CMTRs) by West Jersey Manufacturing Co. (WJM) and Piping Systems, Inc. (PSI). Specific actions were required of utilities. Some of these could efficiently be addressed by a generic program. NUMARC initiated such a program. The NRC issued Supplement 1 to 88-05 subsequent to reports of two blind flanges having low tensile strength. The supplement required utilities to perform field tests on identified installed WJM/PSI items. The supplement also focused effort on piping flanges and fittings. The NUMARC program was modified to coordinate and standardize field testing methods and to compile utility generated data. Concurrently, the generic NUMARC laboratory testing program has been in progress.

### NUMARC MULTIFACETED PROGRAM

Because several actions were required by 88-05 which could be efficiently addressed in a generic manner, NUMARC undertook the activities described herein as well as the testing and test data analysis which are the subject of this report.

- A. Review of records to permit scope limitation.
- B. Review of records to identify intermediate and secondary supply routes.
- C. Interface with Authorized Inspection Agencies and the National Board of Boiler and Pressure Vessel Inspectors.
- D. Generic stress analysis of fittings and flanges.
- E. Testing, data compilation and evaluation.

### GENERIC STRESS ANALYSIS

The generic stress analysis has been completed, reviewed with and provided to the NRC. The analysis indicates that there is little concern for the stress integrity of the fittings or flanges even if the materials were of substantially lower strength when compared to the strength requirements of SA-105. This report was formally transmitted to the NRC by NUMARC on July 22, 1988.

The testing program is described in the following sections of this report.

### NUMARC TESTING PROGRAM

#### METHODS

This program contains two main elements: first, comprehensive laboratory testing of suspect items contributed by utilities; and second, utility generated data of destructive laboratory tests and in situ tests of installed suspect items.



NUMARC laboratory test methods follow ASTM standards for tensile testing to produce values for UTS, YS ZEl and ZRA. Tensile strength correlations were developed based upon Equotip testing. Chemical analysis utilizes spectrographic analysis and portable X-ray fluorescence analysis methods. All laboratory testing equipment is calibrated to appropriate standards.

Utility test data of installed items or warehouse items has principally been portable hardness testing by means of the Equotip device. Other hardness test devices may also have been used in a few instances. The basis for selection of hardness test methods and the NUMARC training/coordination have been described previously.

For austenitic stainless steel items, the principle tests method has been a simple magnetic check. Some alloy analysis and replication metallography have been performed.

To the extent that utilities have contributed laboratory test data, these data has been accepted. These data are being reviewed for consistency and errors.

#### DATA COMPILATION AND RESULTS

Generic laboratory test data has been developed for 123 items to date contributed by utilities.

To date, the utilities have provided data regarding 1334 field hardness test items and 108 tensile results. The results are discussed in the following analysis. The actual amount of data used in this report is indicated on the plots or charts. Not all data is in the computer data base.

NUMARC has provided the NRC with computer discs and printouts as of 7/19/88. Some additional copies were provided during the July 22, 1988 meeting.

#### ANALYSIS

##### LABORATORY TESTING

All tensile test results exceed 70 KSI or are within the anticipated tolerance band. Figure 1 shows a histogram of laboratory tensile results. In general, field tests were performed with EQUOTIP testers and the data converted to BHN. For reasons discussed below, EQUOTIP values are used in this report.

Figure 2 shows a plot of laboratory tensile results and EQUOTIP hardness expressed as BHN data. Almost all the hardness data points fall at or below the ASTM A370 BHN tensile conversion line, indicating that this is a conservative approach, and that a test tolerance factor is required to avoid inappropriate rejection of acceptable material by field hardness test methods. It is apparent that the BHN tensile conversion approach is no longer appropriate for this application.

##### EQUOTIP-TENSILE CONVERSION

Another more accurate approach to assess the field hardness data is to develop a best fit line for the laboratory hardness using the original EQUOTIP (also referred to as Leeb values) and tensile data. That line, shown in Figure 3, was developed by computer program. The application of the tolerance or the

best fit approach are discussed below subsequent to a brief analysis of the utility field data. The histogram of laboratory hardness data expressed in EQUOTIP values is shown in Figure 4.

#### UTILITY TESTING

The utility-provided laboratory data is consistent with the generic program test data. The utilities have provided one set of data on a blind flange, Heat 7218, which is consistent with the two tests cited in 88-05 Supplement 1. This data point is not yet in the computer printout. Other than this, no substrength material has been reported based on tensile tests. These utilities have reported tensile strength for 108 items. Eight items slightly below 70 KSI have been reported. The remaining 101 values exceed 70 KSI. In one case the utility engineer indicated there was a subsize specimen removed from installed flange and was transverse to the primary working direction rather than parallel. These slightly low values are readily explained by the test direction, and by published data which confirms that tensile test results from product testing may be as much as 10 percent below the minimum specified strength. None of these utilities reported strength values are a concern.

The utility generated hardness data is shown in the histogram of Figure 5. This histogram has the same general bell shape as the histogram of laboratory hardness data. In simple terms, the bell shapes in both laboratory and field histograms and the lack of bumps at the low hardness ends of the histograms indicates that there is not a concern for low strength material. This means that the vast majority of field items would exceed 70 KSI if tested and that the remainder would be within the expected tolerance band. The conclusion is that installed items are acceptable and do not present a material concern, except for some blind flanges.

#### FIELD HARDNESS TO TENSILE

It is appropriate to compare the best fit curves of laboratory hardness and tensile results and apply the results of that plot to the utility generated hardness data. When this is done, refer to Figure 6, all items are shown to be acceptable. It must be realized that a best fit curve of field hardness should never be used to reject installed items, because some items which fall below the line can be within the acceptable tolerance band. This is shown by the fact that the original data had some acceptable items below the best fit curve. The best fit curve may be applied to warehouse items prior to installation, and should not be the sole justification for removal of installed items. This curve increases the confidence that the installed items are as initially intended to be.

#### BLIND FLANGES

The best fit curve applied to field data, or a field hardness test tolerance does not eliminate the fact that there are data in the histograms (but not yet in the computer data base) which indicates that blind flanges may be a concern for strength reasons. However, the stress analytical data provided to the NRC indicates that these substrength blinds are not a stress problem for service conditions.

The lowest hardness test result in either laboratory or field, aside from the suspect blind flanges, is 350 Lp. This is the lowest of a continuous spectrum of values. The 13 suspect blind flanges are at approximately 330 Lp and appear to be a unique group separate from the general population of acceptable material.

#### DATA QUANTITY AND STATISTICAL SIGNIFICANCE

Analysis indicates that there are sufficient field data upon which to draw conclusions. There is no need for additional field hardness data. There is also substantial tensile test data which permits interim conclusions. Non-parametric tolerance limit statistical calculations were used. The laboratory tensile results of 123 items provide 95 percent confidence that more than 97 percent of the population exceeds 60,600 psi tensile strength.

The utility provided 108 tensile test results provide 95 percent confidence that more than 97 percent of the population exceeds 66,400 psi tensile strength.

Assuming the materials come from the same population, combining both sets of tensile data provides 95 percent confidence that more than 98 percent of the population exceed 60,600 psi ultimate tensile strength. Similarly, there is 95 percent confidence that more than 98 percent of the population is less than 93,200 psi ultimate tensile strength.

#### TESTING SUMMARY

The laboratory tensile data indicates there is no technical concern for the SA 105 material. The similarities between the laboratory hardness distribution histogram and the field hardness histograms indicates that there should be no concern for installed items given that the laboratory tensile tests indicate no concern for this material. The best fit curve of hardness to tensile conversions applied to field hardness tests also indicates that there is no concern for SA 105 material.

#### TOLERANCES LOWER AND UPPER

The data indicate that there is no real concern for SA 105 material. The blind flanges of suspect material which have low tensile values have hardness at approximately 330 Lp.

Regarding high hardness, Table 1 shows the precedent to install materials over 187 BHN to 207 BHN which are common in nuclear plant piping. This table shows that 237 BHN is a value commonly applied to fabricated items, welds, base metals and HAZ, where H<sub>2</sub>S stress corrosion cracking (SCC) is a concern in the petrochemical industry. Such SCC is not a concern in light water reactor piping and thus a specific upper limit should not be imposed. The Structural Welding Code applies a 265 BHN limit on submerged arc welds and HAZ to assure adequate strength, ductility and toughness. When recognized standards apply values such as 237 and 265 BHN to fabricated, welded and installed items, a specific upper hardness limit is not justified. This paragraph is discussed in BHN terms because the Code uses BHN terms.

The principle high hardness concern is weldability. If the installed item has acceptable weld inspections, has sustained bolt-up loads, hydrostatic tests, proof testing, functional test and whatever PSI/ISI that is applicable, then

there are objective reasons to use as is. The benefits of replacing installed high hardness items with acceptable welds and HAZ are minimal. In contrast, the risks in any replacement are greater. The ALARA considerations also indicate that high hardness items not be replaced unless there is a plant-unique overriding concern.

#### STAINLESS STEEL

There is a relatively small amount of stainless steel installed, and very little in warehouses. To date, all tests performed on stainless steel have been acceptable. Approximately four dozen items have been tested. All tensile results are acceptable, all chemical analyses are acceptable and all sensitization tests are acceptable. Approximately 10 dozen magnetic checks were also acceptable. Only one of all these test results is slightly low; that is, one yield strength value was 28.5 KSI vs. 30.0 KSI, and this difference is insignificant. These tests are summarized in Table 2.

While the absolute number of test results is not as great as for carbon steel, the results indicate there is no concern.

#### CONCLUSIONS

The strength of SA 105 material and stainless steel items which were suspect is not a concern.

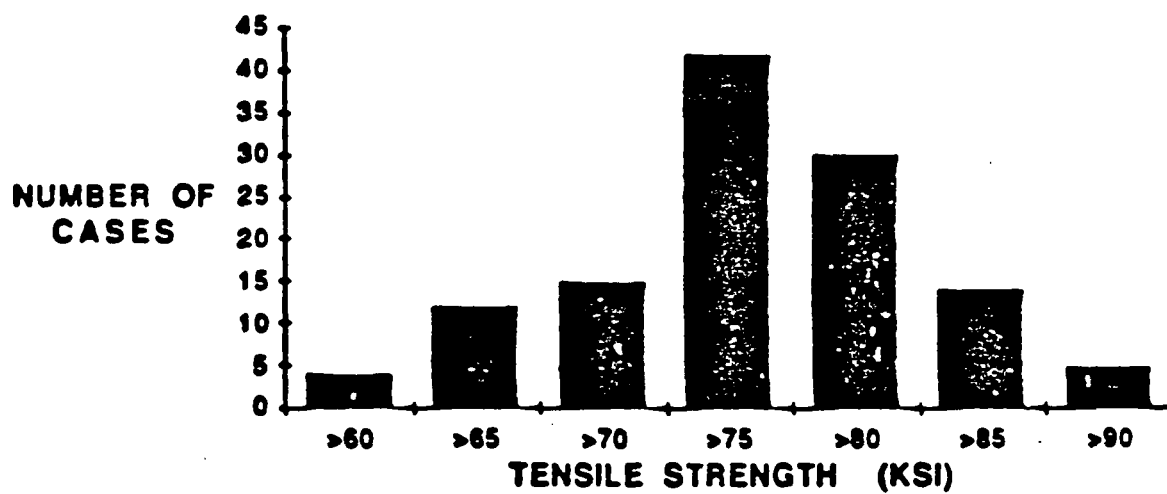
#### RECOMMENDATIONS

1. The test results to date indicate there is no concern for materials and thus field testing may be suspended as there is sufficient data for evaluation.

The generic stress analysis also indicates there is no concern for plausible low strength materials because it has been shown that even if substrength materials were installed, the vast majority of these cases would be acceptable. Thus, it is appropriate to suspend document reviews and field testing.

2. The laboratory program should be completed subject to constraints of available material.
3. The existing utility generated data should be compiled and analyzed in the NUMARC program.
4. A summary report should be generated.

## LABORATORY TENSILE RESULTS



Data as of  
7/22/88

FIG. 1 HISTOGRAM OF  
LABORATORY TENSILE  
RESULTS

## LABORATORY HARDNESS VS. TENSILE STRENGTH

Data as of  
22 July 1988

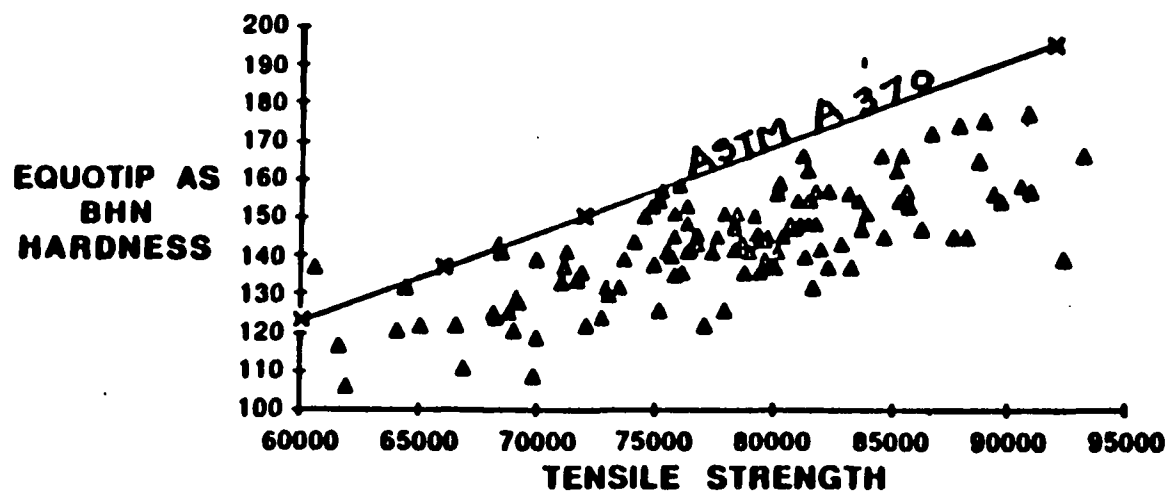
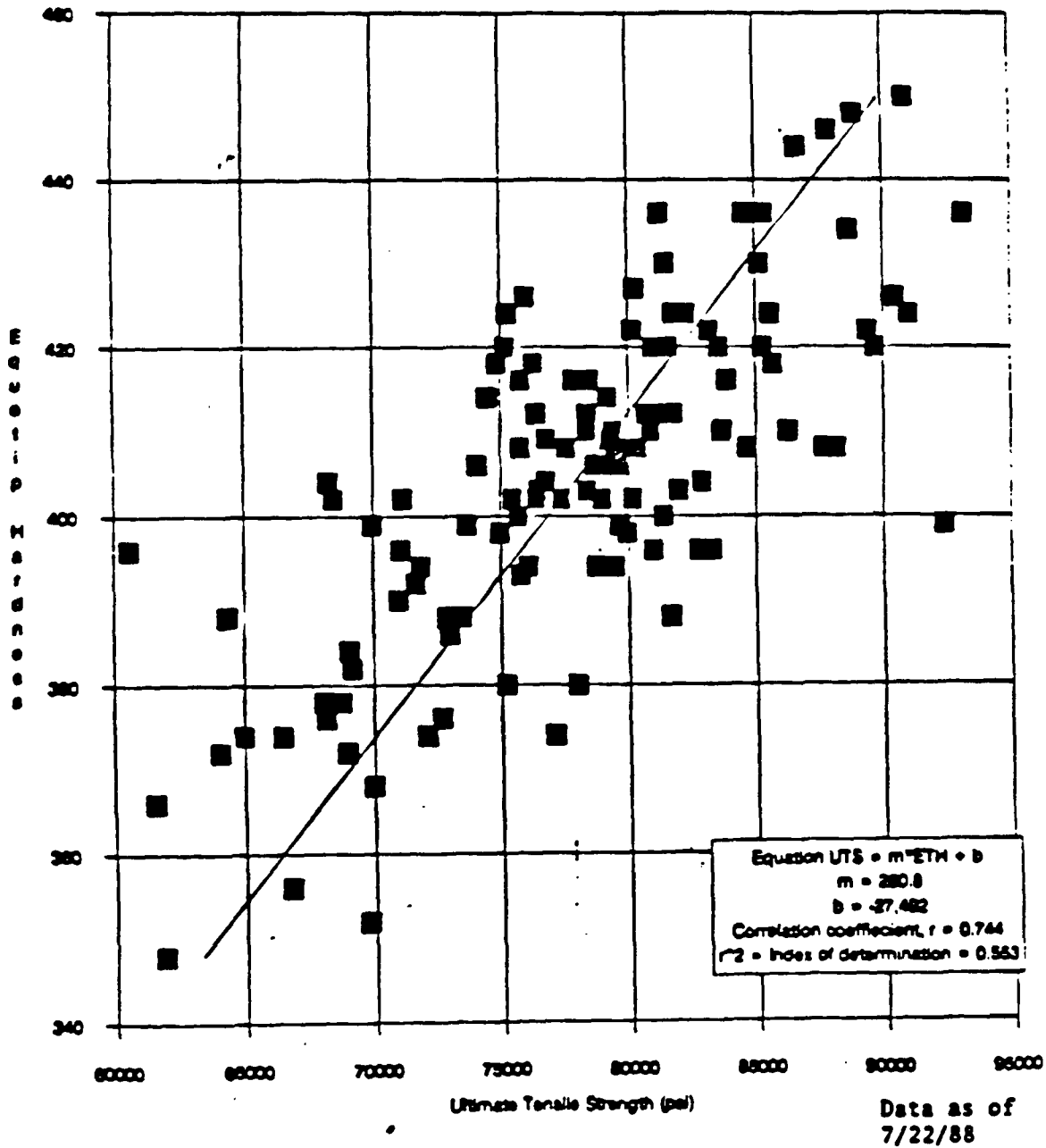


FIG. 2 EQUOTIP AS BHN  
HARDNESS COMPARED TO  
TENSILE & ASTM A370

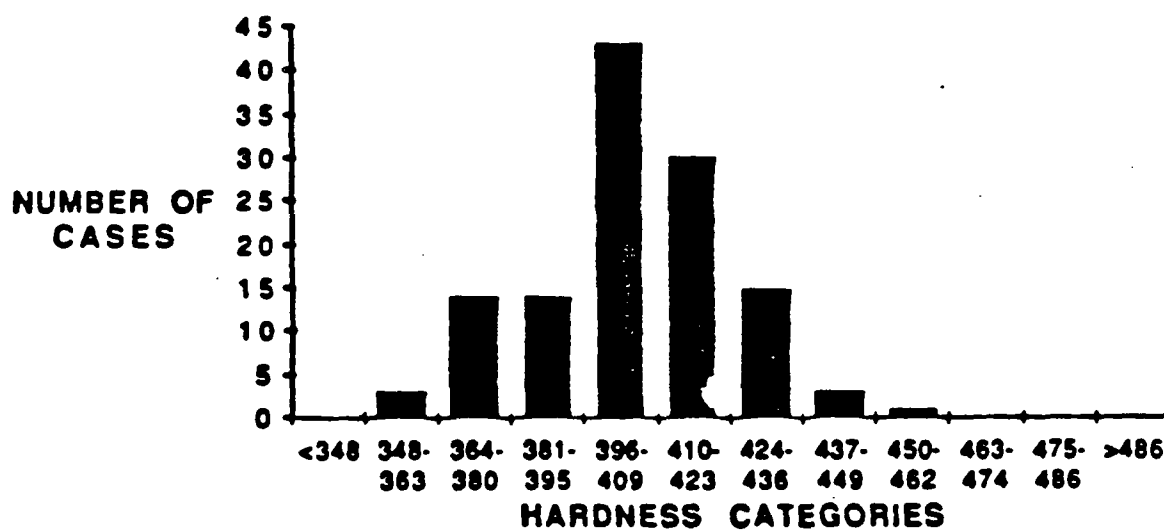
**Equotip Hardness vs. Ultimate Tensile Strength  
Laboratory Test Results**



**FIG. 3 BEST FIT EQUOTIP VS TENSILE  
STRENGTH**

Data as of  
22 July 1988

## SA 105 LAB EQUOTIP



Data as of  
7/22/88

FIG. 4. HISTOGRAM OF LABORATORY  
EQUOTIP HARDNESS



Data as of  
20 July 1988

## SA105 FIELD HARDNESS DATA

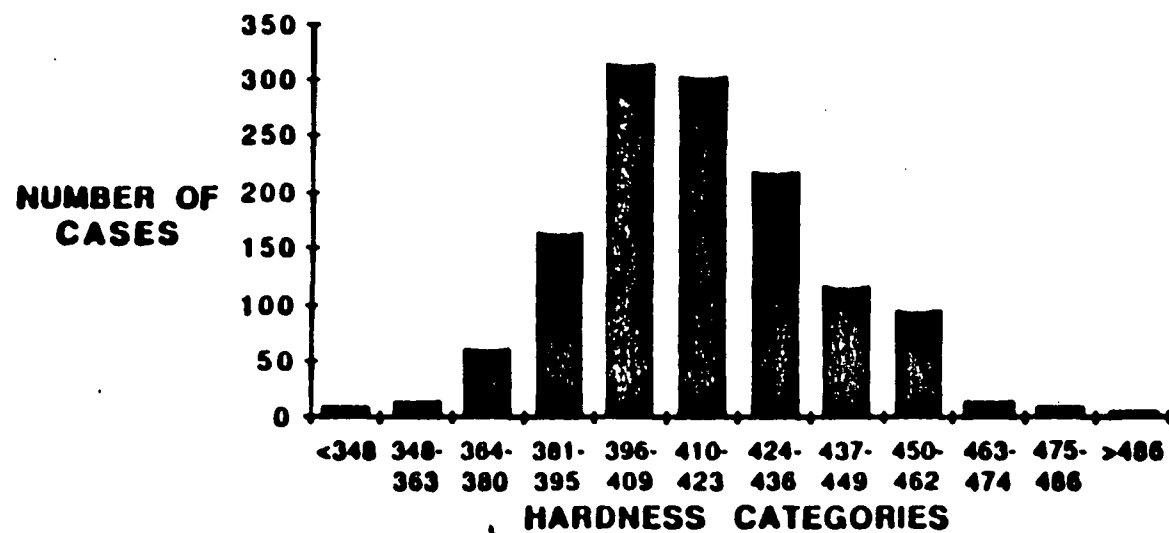


FIG. 5 HISTOGRAM OF EQUOTIP  
FIELD HARDNESS

# ESTIMATED TENSILE STRENGTH DISTRIBUTION

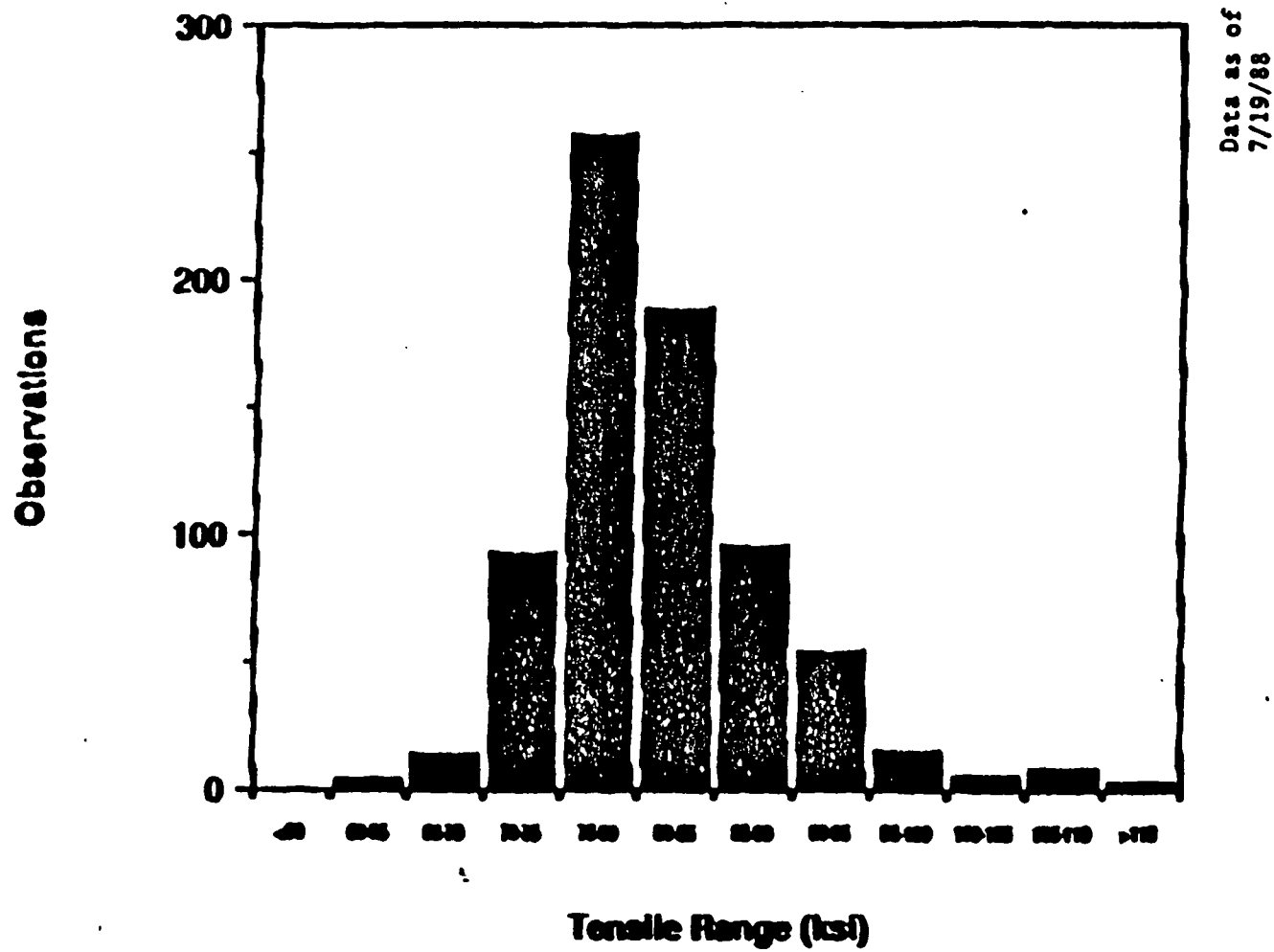


FIG. 6 BEST FIT DATA APPLIED TO  
FIELD HARDNESS  
STRENGTH ESTIMATE

**TABLE 1**  
**SUMMARY OF HIGH HARDNESS LIMITS**

<b>MAX. HARDNESS LIMITS</b>			<b><u>BHN</u></b>
SA	350		197
SA	105	PRE 1972	N/A
SA	105	POST 1972 ONLY IF QUENCHED	187
SA	234	WPB-SUPPLEMENTARY	197
SA	181		N/A
SA	182	F 1	192
		F 2	192
		F 11	207
		F 22	207
AWS	D1.1	WELD & HAZ, HV280	265
NACE	MR-01	75, Rc22 BASE METAL, WELDS, HAZ	237

**TABLE 2**  
**SUMMARY OF STAINLESS STEEL TESTS**

**STAINLESS RESULTS**  
**7/19/88**

<b>TENSILE</b>	<b>9</b>
<b>HARDNESS</b>	<b>8</b>
<b>CHEMISTRY</b>	<b>44</b>
<b>SENSITIZATION</b>	<b>38</b>
<b>MAGNETIC</b>	<b>120</b>

Product Forms Sold By WJM/PSI/Chews Landing<sup>1</sup>

Flanges  
Half Couplings  
Full Couplings  
Plate Rings  
Penetration Plates -- SA516, GR70  
Seal Plates -- SA516, GR70 (Perry)<sup>2</sup>  
Socket Weld Nozzles (CLM)  
Long Drain Boss -- A182F11 & F22  
Radiograph Plugs (CLM)  
Square Bar -- 1018  
Spacers  
Sample Probes Class 1 -- SA312, T304 (Perry) (CLM)  
Guide Lugs -- SA240, T304  
Socket Welded Half Couplings Class 1 -- SA182, F304L (Vogtle)  
Special Nozzles  
Pipe Caps -- SA234  
Lugs -- SA240, T304 (Palo Verde)  
Lugs -- SA516, GR70 (Palo Verde)  
Socket Weld Couplings  
Plate -- SA36 (Perry)  
Special Boss -- A234, A105, A739  
Bolts -- SA193, GRB7 (Confrentes/Spain)  
Instrument Penetration End Plate -- SA516, GR70 (Perry)  
Hanger Lugs -- SA516, GR70 (Dravo/Site unknown)  
Socket Weld Boss -- Class 1 -- SA182, F316 (Seabrook) (CLM)  
Transition Piece -- SA105 (Vogtle)  
Thermowells -- A182 (Dravo/Hunter/Site unknown) (CLM)  
Bar Stock -- A105 (Dravo/Yellow Creek) (CLM)

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<sup>1</sup> This is a complete list of all product forms identified during the NRC staff's review of available records.

<sup>2</sup> Specific nuclear power plants or customers are noted in cases where the product form appeared to be a unique or special order and not wide spread.

<sup>3</sup> Indicates that material was sold by Chews Landing Metal Manufacturers Inc.

Nuclear Plants Receiving Suspect Material<sup>1</sup>

Beaver Valley  
Bellefonte  
Browns Ferry  
Callaway  
Calvert Cliffs  
Cock  
Diablo Canyon  
Duane Arnold  
Fermi  
Hatch  
Monticello  
North Anna  
Prairie Island  
Quad Cities  
Shoreham  
Turkey Point  
Waterford  
Yellow Creek  
Zimmer

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<sup>1</sup> These nuclear power plants are in addition to those previously identified as receiving suspect material.

Purchasers Receiving Suspect Material<sup>1</sup>

Barr - Saunders, Inc.  
M.W. Kellogg (became Division of Pullman)  
Lake Erie Iron & Metal Co., Inc.  
Liberty Equipment, Co.  
Metal Bellows (listed as Bellows in Bulletin)  
Power Piping Co.  
Standards Pipe & Supply Co., Inc.  
Tioga Pipe Supply Co., Inc.  
Tyler Lawson (listed in error as Tyler Davison in Bulletin)

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<sup>1</sup> These purchasers are in addition to those previously identified and are known to have received material for nuclear applications.

LIST OF RECENTLY ISSUED  
NRC BULLETINS

Bulletin No.	Subject	Date of Issuance	Issued to
88-08, Supplement 2	Thermal Stresses in Piping Connected to Reactor Coolant Systems	8/4/88	All holders of OLs or CPs for light-water-cooled nuclear power reactors.
88-09	Thimble Tube Thinning in Westinghouse Reactors	7/26/88	All holders of OLs or CPs for W-designed nuclear power reactors that utilize bottom mounted instrumentation.
88-08, Supplement 1	Thermal Stresses in Piping Connected to Reactor Coolant Systems	6/24/88	All holders of OLs or CPs for light-water-cooled nuclear power reactors.
88-08	Thermal Stresses in Piping Connected to Reactor Coolant Systems	6/22/88	All holders of OLs or CPs for light-water-cooled nuclear power reactors.
88-05, Supplement 1	Nonconforming Materials Supplied by Piping Supplies, Inc. at Folsom, New Jersey and West Jersey Manufacturing Company at Williamstown, New Jersey	6/15/88	All holders of OLs or CPs for nuclear power reactors.
88-07	Power Oscillations in Boiling Water Reactors (BWRs)	6/15/88	All holders of OLs or CPs for BWRs.
88-06	Actions to be Taken for the Transportation of Model No. Spec 2-T Radiographic Exposure Device	6/14/88	All NRC licensees authorized to manufacture, distribute, or operate radiographic exposure devices or source changers.

OL = Operating License  
CP = Construction Permit



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

November 22, 1988

**NRC Bulletin No. 88-10: NONCONFORMING MOLDED-CASE CIRCUIT BREAKERS**

**Addressees:**

All holders of operating licenses or construction permits for nuclear power reactors.

**Purpose:**

The purpose of this bulletin is to request that addressees take actions to provide reasonable assurance that molded-case circuit breakers (CBs), including CBs used with motor controllers, purchased for use in safety-related applications without verifiable traceability<sup>1</sup> to the circuit breaker manufacturer (CBM)<sup>1</sup> perform their safety functions.

**Description of Circumstances:**

NRC Information Notice No. 88-46, "Licensee Report of Defective Refurbished Circuit Breakers," dated July 8, 1988 and Supplement 1 thereto, dated July 21, 1988, discussed a report by Pacific Gas and Electric Company that indicated that its Diablo Canyon Nuclear Power Plant was supplied 30 CBs by Anti-Theft Systems, Inc. through a local electrical distributor. These CBs (Square D molded-case, type KHL 36125) were intended for use in non-safety-related applications at the Diablo Canyon Nuclear Power Plant. Square D Company reported that an inspection and testing of these breakers determined that the CBs were refurbished Square D Company equipment. Furthermore, Square D reported that several of the circuit breakers tested did not comply with Square D or Underwriters Laboratories, Inc. (UL) specifications for all of the electrical tests performed. Information Notice No. 88-46 also listed several California companies that were involved in supplying surplus refurbished and possibly defective refurbished electrical equipment to the nuclear industry.

During recent NRC inspections, additional examples were identified that indicate a potential safety concern regarding electrical equipment supplied to nuclear power plants. The NRC is concerned that equipment being procured as new and assumed to meet all applicable plant design requirements and/or original manufacturer's specifications may, in fact, not conform to these requirements and specifications.

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1. Refer to Attachment 2 for Definition of Terms

The actions requested in this bulletin are limited to molded-case CBs. Molded-case CBs are tested and calibrated at the manufacturer's plant in accordance with recognized industry standards, such as UL-489, "Molded Case Circuit Breakers and Circuit Breaker Enclosures," and National Electrical Manufacturers Association (NEMA)-AB1, "Molded-Case Circuit Breakers." Since molded-case CBs have factory-calibrated and sealed elements, any unauthorized modification or refurbishing of these CBs could jeopardize their design capability and reliability.

The NRC is concerned that the reliability and capabilities of refurbished CBs purchased as commercial grade (non-Class 1E) for later upgrading to safety-related (Class 1E) applications may not meet the minimum commercial grade standards. In addition, the NRC is concerned about the reliability and capabilities of commercial grade CBs upgraded to safety-related because of some observed inadequacies in the dedication process and numerous failures found during the testing of some of these CBs. In order to properly dedicate electrical items procured as commercial grade for subsequent use in safety-related applications, the dedication process should build from the commercial grade quality, include a proper evaluation of seismic and environmental qualification, confirm critical parameters, and include testing as appropriate.

Molded-case CBs purchased from the CBM or that can be traced to the CBM are of lesser concern than other molded-case CBs because CBs from the CBM, whether safety-related or commercial grade, are manufactured under controlled conditions to conform to a proven design. Safety-related CBs purchased as Class 1E from the CBM are controlled under quality assurance (QA) programs that conform to Appendix B of 10 CFR Part 50. While upgrading programs may vary in quality, the controls exercised by the CBM over the manufacturing activities provide reasonable assurance that improperly refurbished components have not been introduced and passed through the upgrading process. Furthermore, the redundancy of safety systems and the in-service use of CBs provide a reasonable basis for accepting installed replacement CBs that have been procured from the CBM or that can be traced to the CBM.

The NRC currently believes that the concerns addressed in this bulletin do not apply to electrical equipment (safety-related and commercial grade) originally installed in plants. This equipment appears to have been procured during plant construction from CBMs with full certification. The large quantities of electrical assemblies or components procured under bid packages during plant construction reduce the possibility of any original plant equipment being supplied by vendors doing refurbishing.

Although the actions requested in this bulletin only apply to safety-related molded-case CBs, the NRC intends to monitor industry programs to ensure that other molded-case CBs, which may have been installed as replacements, installed during modifications, or are being maintained as stored spares, are suitable for their intended service. Addressees are encouraged to participate in a joint program. If industry programs are either not timely or not sufficient, additional regulatory actions will be taken, as appropriate.

The NRC requested and received comments from the Nuclear Management and Resources Council (NUMARC), the National Electrical Manufacturers Association (NEMA), and the Underwriters Laboratories, Inc. (UL), during the preparation of this bulletin. These comments were considered and some were appropriately incorporated into this bulletin.

NEMA has commented to the NRC that determination of the critical performance characteristics of durability and short-circuit capabilities of CBs requires destructive testing of selected breakers that are representative of CBs to be placed in service. Because a refurbished breaker may not have been refurbished under controlled conditions to conform to a proven design, destructively testing selected breakers will not infer anything about a refurbished CB. UL provided specific comments on the tests in Attachment 1 of this bulletin. In addition, they stated that, "it is UL's opinion that the test program is not adequate to provide assurance that the tested, non-traceable, circuit breakers would be suitable for their intended purpose." Although the test program described in Attachment 1 of this bulletin does not provide complete verification of all the performance requirements and characteristics of molded-case CBs (such as seismicity or fault clearing capability), the NRC considers the test program to provide a reasonable assurance of performance requirements and characteristics most important to ensuring reactor safety. This, considered in conjunction with (1) the limited number of nonconforming CBs that may remain installed in safety-related systems following implementation of the actions requested by this bulletin, (2) the existence of redundant safety-related systems in nuclear power reactors that are required by NRC regulations, (3) the license required in-service testing of installed CBs performed to demonstrate the CB's functional performance, and (4) the low frequency of occurrence of seismic events and severe electrical faults, provides a reasonable assurance that nuclear power reactors can be operated without undue risk to the health and safety of the public.

The NRC investigation of this issue is not complete. A supplement to this bulletin may be issued to include other electrical equipment or a longer procurement review period if warranted by the results of the ongoing evaluations or the results of testing requested in this bulletin.

**Actions Requested:**

1. All addressees are requested to perform the following review by March 1, 1989:
  - a. Identify all molded-case CBs purchased prior to August 1, 1988, that are being maintained as stored spares for safety-related (Class 1E) applications or commercial grade CBs that are being maintained as stored spares for future use in safety-related applications; this includes CBs purchased from a CBM or from any other source. If the number of these stored spare CBs is less than 50 at a nuclear plant site, then randomly select CBs purchased between August 1, 1983 and August 1, 1988 that have been installed in safety-related applications as replacements or modifications to form a minimum sample of 50 CBs per nuclear plant site.

- b. Verify the traceability of these CBs.
  - c. Identify the number, manufacturer, model number, and to the extent possible the procurement chain for all those CBs identified in (1a) that cannot be traced to the CBM. For installed CBs, also identify each system in which they are/were installed.
- 2. All holders of operating licenses who identify installed CBs per item 1 above or item 4 below that cannot be traced to a CBM are requested to prepare, within 30 days of the completion of each item, an analysis justifying continued operation until items 1 through 5 of the actions requested in this bulletin have been completed.
  - 3. All addressees who identify 80 percent or more CBs traceable to the CBM per item 1 above are requested to test the CBs that are not traceable to the CBM in accordance with the test program described in Attachment 1. Any installed CBs that fail any of these tests should be replaced with CBs that meet the criteria of item 7 of the actions requested or CBs that pass all tests in accordance with the testing program described in Attachment 1. If more than 10 percent of the CBs tested fail any of the tests described in Attachment 1, continue with item 4; otherwise, proceed to item 6 of the actions requested.

Holders of operating licenses are requested to complete this testing program before startup from the first refueling outage beginning after March 1, 1989. Holders of construction permits are requested to complete this testing program before fuel load.

- 4. All addressees who identify less than 80 percent of the CBs traceable to the CBM per item 1 above or who identify a failure rate of more than 10 percent for the CBs tested per item 3 above are requested to perform the following actions:
  - a. Identify all molded-case CBs that have been purchased between August 1, 1983 and August 1, 1988, and installed in safety-related applications as replacements or installed during modifications.
  - b. Verify the traceability of these CBs.
  - c. Identify the number, manufacturer, model number, system in which they are/were installed, and to the extent possible, the procurement chain for all those CBs identified in (4a) that cannot be traced to the CBM.
- 5. All addressees who identify installed CBs that cannot be traced to the CBM per item 4 above are requested to replace these CBs with components that meet the criteria of item 7 of the actions requested or to test them in accordance with the program described in Attachment 1; CBs that fail any of these tests should be replaced with CBs that meet the criteria of item 7 of the actions requested or CBs that pass all tests in accordance with the test program described in Attachment 1.

Holders of operating licenses are requested to replace or to test at least one-half, or all if the total number is less than 75, of these installed CBs before startup from the first refueling outage beginning after March 1, 1989. The remaining CBs should be replaced or tested before startup from the second refueling outage beginning after March 1, 1989.

Holders of construction permits are requested to replace or to test these installed CBs before fuel load.

6. Information generated while performing the actions requested in items 1, 2, 3, 4, and 5 above should be documented and maintained for a period of 5 years after the completion of all requested actions.
7. With the exception of actions taken in response to items 3 and 5 of the actions requested above, molded-case CBs installed in safety-related applications after August 1, 1988 should be:
  - a. Manufactured by and procured from a CBM under a 10 CFR 50, Appendix B, program; or
  - b. Procured from a CBM or others with verifiable traceability to the CBM, in compliance with applicable industry standards, and upgraded to safety-related by the licensee or others using an acceptable dedication program. The NRC encourages addressees to significantly upgrade their dedication programs through a joint industry effort to ensure their adequacy and consistency. The NRC will monitor these industry initiatives and if they are not sufficient or not timely, or if problems with the dedication of commercial grade equipment for safety-related use continue, the NRC will take appropriate regulatory actions.
8. Addressees that cannot meet the schedule for the actions requested above and/or the corresponding reporting requirements below, should justify to the NRC their proposed alternative schedule.

Reporting Requirements:

1. All holders of operating licenses are required to provide a written report by April 1, 1989, that:
  - a. Confirms that only molded-case CBs that meet the criteria of item 7 of the actions requested are being maintained as stored spares for future use in safety-related applications.
  - b. Summarizes the total number, manufacturer, model number, and to the extent possible the procurement chain of those CBs that could not be traced to the CBM in items 1 and 4 of the actions requested. For installed CBs, also identify each system in which they are/were installed. If item 4 of the actions requested has not been completed

by April 1, 1989, due to the schedule for tests in item 3 of the actions requested, this information should be updated within 30 days of the completion of item 4 to address those additional CBs that could not be traced to the CBM.

- c. Confirms that items 1, 2, 3, 4, 5, 6 and 7 of the actions requested have been completed or will be implemented as requested.
2. All holders of operating licenses are required to submit a report that summarizes available results of tests conducted in accordance with items 3 and 5 of the actions requested within 30 days after startup from the first and second refueling outages beginning after March 1, 1989. For CBs that pass these tests, the only information required is the number, manufacturer, model number, and to the extent possible the procurement chain of CBs tested (summary report format is acceptable). For CBs that fail these test(s), these reports should indicate the test(s) and the values of test parameter(s) at which the failure(s) occurred, as well as the corresponding manufacturer, model number, and to the extent possible, the procurement chain.
3. All holders of construction permits are required to provide a written report by April 1, 1989, that:
  - a. Confirms that only molded-case CBs that meet the criteria of item 7 of the actions requested are being maintained as stored spares for future use in safety-related applications.
  - b. Summarizes the total number, manufacturer, model number, and to the extent possible the procurement chain of those CBs that could not be traced to the CBM in items 1 and 4 of the actions requested. For installed CBs, also identify each system in which they are/were installed. If item 4 of the actions requested has not been completed by April 1, 1989, due to the schedule for tests in item 3 of the actions requested, this information should be updated within 30 days of the completion of item 4 to address those additional CBs that could not be traced to the CBM.
  - c. Confirms that items 1, 3, 4, 5, 6 and 7 have been completed or will be implemented before fuel load.
4. All holders of construction permits are required to submit a report that summarizes the results of tests conducted in accordance with items 3 and 5 of the actions requested within 30 days after fuel load. For CBs that pass these tests, the only information required is the number, manufacturer, model number, and to the extent possible, the procurement chain (summary report format is acceptable). For CBs that fail these test(s), the report should indicate the test(s) and the values of test parameter(s) at which the failure(s) occurred, as well as the corresponding manufacturer, model number, and to the extent possible, the procurement chain.

The written reports required above shall be addressed to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, under oath or affirmation under the provisions of Section 182a, Atomic Energy Act of 1954, as amended. In addition, a copy shall be submitted to the appropriate Regional Administrator.

This request is covered by Office of Management and Budget Clearance Number 3150-0011 which expires December 31, 1989. The estimated burden hour is 1000 to 10,000 man-hours per plant response, including assessment of these requirements, searching data sources, testing, and analyzing the data, and preparing the required reports. Comments on the accuracy of this estimate and suggestions to reduce the burden may be directed to the Office of Management and Budget, Room 3208, New Executive Office Building, Washington, D.C., 20503, and to the U.S. Nuclear Regulatory Commission, Records and Reports Management Branch, Office of Administration and Resource Management, Washington, D.C., 20555.

If you have any questions regarding this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate NRC regional office.

*Charles E. Rossi*  
Charles E. Rossi, Director-  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: Paul Gill, NRR  
(301) 492-0811

Jaime Guillen, NRR  
(301) 492-1170

**Attachments:**

1. Test Program for Molded Case Circuit Breakers
2. Definition of Terms
3. List of Recently Issued NRC Bulletins

## TEST PROGRAM FOR MOLDED-CASE CIRCUIT BREAKERS

### 1.0 Test Program Objectives

The objective of this proposed test program is to verify the reliability and capabilities of molded-case circuit breakers (CBs).

For the safety of personnel and others involved with the activities related to these proposed tests, appropriate safety practices, such as ANSI/NFPA 70E, "Electrical Safety Requirements for Employee Workplaces," Part II, should be followed.

These proposed tests have been based on tests described in industry standards, such as NEMA AB-1, "Molded-Case Circuit Breakers," NEMA AB-2, "Procedures for Field Inspection and Performance Verification of Molded-Case Circuit Breakers Used in Commercial and Industrial Applications," UL 489 "Molded Case Circuit Breakers and Circuit Breaker Enclosures," and NETA STD ATS-1987, "National Electrical Testing Association, Acceptance Testing Specifications."

### 2.0 Test Procedures for CBs

The following tests should be performed in the sequence listed. CBs failing any of these tests should be considered unacceptable for safety-related applications.

#### 2.1 Mechanical Test

The CB should be operated, reset, and closed a minimum of five times, to ensure that the latching surfaces are free of any binding.

#### 2.2 Individual Pole Resistance or Millivolt Drop Test (Ref. NETA STD ATS-1987 & NEMA AB-2)

The contact resistance of each pole of the CB should be measured at ambient temperature. Three readings of each pole should be taken with the CB operated without load between each reading. The average of three readings for each pole should be calculated and compared with the manufacturer's contact resistance data or with those values of similar CBs from the same manufacturer. Also, the average value for each pole should be compared with the average of the other poles and the difference between the pole values should not exceed 50 percent of the lowest value; or

A millivolt drop test may be performed by applying a direct current across the closed CB contacts and measuring the voltage drop due to the contact resistance. The millivolt drop test should be performed at room temperature. Direct current should be applied across each



pole and the millivolt drop and test current recorded for each pole. Three readings of each pole should be taken with the CB operated without load between each reading. The average of the three readings for each pole should be calculated and compared with the manufacturer's value for acceptance of the breaker.

**2.3 Rated Current Hold-In Test (Ref. NEMA AB-1 & UL 489)**

This test should be conducted at 100% rated current and at an ambient air temperature of  $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ , and followed by a test at 135% rated current and at an ambient temperature of  $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ .

Equal 100% rated currents should be applied to all poles of the CB. The CB must not trip within 1 hour for CBs rated 50 amperes or below or within 2 hours for CBs rated over 50 amperes during this test. At the end of the 100% rated current test, the current should be increased to 135% and the CB should trip within 1 hour for CBs rated 50 amperes or below or within 2 hours for CBs rated over 50 amperes.

**2.4 Overload Test (Ref. NEMA AB-1 & UL 489)**

This test consists of one operating cycle (i.e., closing action followed by an opening action) of the CB at 600% rated current. This test may be conducted at low voltage. There should be no electrical or mechanical breakdown of the CB during this test.

**2.5 Instantaneous Trip Test (Ref. NEMA AB-1 & UL 489)**

**2.5.1 Fixed Instantaneous Setting CBs**

Each pole of the CB should be tested for pickup of the instantaneous unit. Each pole must be between 75% and 125% of the instantaneous trip rating. The trip time should not exceed 0.1 seconds (6 cycles).

**2.5.2 Adjustable Instantaneous Setting CBs**

This test is the same as that in Section 2.5.1 except that each pole must be tested at the lowest and highest settings.

The trip value for the lowest setting should be between 75% and 125% of the lowest setting, and the highest setting should be between 80% and 120% of the highest setting.

**2.5.3 Short-Time Trip Setting Test**

This test is applicable only if the CB is equipped with the short-time delay trip. This test should be conducted at an ambient air temperature of  $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ . The operation of the short-time delay unit should be within 90% and 125% of the overcurrent setting of the CB as shown on the manufacturer's time-current curves.

## 2.6 Time Delay Overcurrent Trip (Ref. NEMA AB-2)

This test should be conducted at an ambient air temperature of  $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ .

A current of 300% (at low voltage) of the marked rating should be applied to each pole of the CB. The trip time for each pole should be compared with the time shown in the CB manufacturer's time-current curves. If the test trip times obtained for each pole are not within the time band shown on the CB manufacturer's time-current curves, then the test trip must not exceed the time specified in Table 1 and the acceptance of the CBs must be evaluated with the criteria listed below:

**TABLE 1**  
**VALUES FOR OVERCURRENT TRIP TEST**  
**(AT 300% OF RATED CONTINUOUS CURRENT OF CIRCUIT BREAKER)**  
**(REF. NEMA AB-2)**

<u>Breaker Voltage Volts</u>	<u>Range of Rated Continuous Current Amperes</u>	<u>Maximum Tripping Time In Seconds</u>
240	15-45	50
240	50-100	70
600	15-45	70
600	50-100	125
240	110-225	200
240	250-400	300
600	110-225	250
600	250-400	300
600	450-600	350
600	700-1200	500
600	1400-2500	600
600	3000-5000	650

Minimum Tripping Time: If the minimum tripping times are lower than indicated by the manufacturer's time-current curves for the CB under test, the CB should be retested after it has been cooled to  $25^{\circ}\text{C}$ . If the values obtained are still lower after retest, the coordination with upstream and downstream CB should be evaluated. If no problem with coordination is indicated, then the CB is acceptable.

Maximum Tripping Time: If the tripping time exceeds the maximum tripping time shown on the manufacturer's time-current curves but is below the time shown in Table 1, check the CB time against the protection requirements of the circuit (such as cable, penetration, etc.) to ensure that the CB provides the protection, as well as the coordination with upstream and downstream CBs. If the CB provides the necessary protection and coordination, then the CB is acceptable.

Maximum Allowable Time: If the tripping time of the CB exceeds the trip time shown in Table 1, the breaker is unacceptable for Class 1E applications.

## 2.7

### Dielectric Tests (Ref. NEMA AB-1 & UL-489)

The dielectric test should be conducted at an ac test voltage of 1760 volts ( $80\% \times [2 \times \text{rated voltage} + 1000 \text{ volts}]$ ), or at 2500 volts dc for 1 minute withstand. The dielectric test should be conducted for (1) line to load terminals with CB open, (2) line to line terminals with CB closed, and (3) pole to ground with CB open, and (4) pole to ground with CB closed.

## DEFINITION OF TERMS

### CIRCUIT BREAKER MANUFACTURER (CBM)

The manufacturing facility that actually produced the circuit breaker being purchased.

### VERIFIABLE TRACEABILITY

Documented evidence such as a certificate of compliance that establishes traceability of purchased equipment to the CBM. If the certificate of compliance is provided by any party other than the CBM, the validity of such certificate must be verified by the licensee or permit holder through an audit or other appropriate means.

### DEDICATION PROCESS

The process by which commercial grade (non-Class 1E) equipment is upgraded to safety-related (Class 1E) and is thereby considered qualified for use in safety-related applications. The dedication process must include:

- a. A technical evaluation to determine the characteristics critical to fulfilling the safety function(s).
- b. An acceptance process to ensure that those critical characteristics are met.

LIST OF RECENTLY ISSUED  
NRC BULLETINS

Bulletin No.	Subject	Date of Issuance	Issued to
88-05, Supplement 2	Nonconforming Materials Supplied by Piping Supplies, Inc. at Folsom, New Jersey and West Jersey Manufacturing Company at Williamstown, New Jersey	8/3/88	All holders of OLs or CPs for nuclear power reactors.
88-08, Supplement 2	Thermal Stresses in Piping Connected to Reactor Coolant Systems	8/4/88	All holders of OLs or CPs for light-water-cooled nuclear power reactors.
88-09	Thimble Tube Thinning in Westinghouse Reactors	7/26/88	All holders of OLs or CPs for W-designed nuclear power reactors that utilize bottom mounted instrumentation.
88-08, Supplement 1	Thermal Stresses in Piping Connected to Reactor Coolant Systems	6/24/88	All holders of OLs or CPs for light-water-cooled nuclear power reactors.
88-08	Thermal Stresses in Piping Connected to Reactor Coolant Systems	6/22/88	All holders of OLs or CPs for light-water-cooled nuclear power reactors.
88-05, Supplement 1	Nonconforming Materials Supplied by Piping Supplies, Inc. at Folsom, New Jersey and West Jersey Manufacturing Company at Williamstown, New Jersey	6/15/88	All holders of OLs or CPs for nuclear power reactors.
88-07	Power Oscillations in Boiling Water Reactors (BWRs)	6/15/88	All holders of OLs or CPs for BWRs.

OL = Operating License  
CP = Construction Permit

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

April 26, 1988

NRC INFORMATION NOTICE NO. 88-19: QUESTIONABLE CERTIFICATION OF  
CLASS 1E COMPONENTS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert addressees to a possible problem with the certification of Class 1E components furnished by Planned Maintenance Systems (PMS) of Mt. Vernon, Illinois. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

On April 1, 1988, Wolf Creek Nuclear Operating Corporation (WCNOC) submitted a written 10 CFR Part 21 Notification to NRC Region IV concerning 60 Class 1E fuses that had been procured from PMS. One of the requirements of the purchase order (PO) issued to PMS was that the PO items were to be supplied in accordance with the requirements of a specific fuse qualification specification for Class 1E equipment. This specification contained detailed requirements including materials, environmental qualification, seismic qualification, and inspection/test requirements. The PMS Certificate of Compliance supplied with the order certified that all of the procurement document requirements had been met and no deviations from the requirements had been identified.

The fuses were placed on hold by WCNOC because a required Quality Department surveillance had not been performed. A subsequent WCNOC surveillance revealed that the records in PMS's possession did not support the statement on the PMS Certificate of Compliance that all PO requirements had been met. Qualification specification requirements were not covered by PMS quality assurance records with respect to information on environmental qualification, radiation levels, and seismic qualification. In addition, it could not be established that a required continuity/resistance check of each fuse had been performed before the fuses were shipped.

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Discussion:

The WCNOC 10 CFR Part 21 notification has brought into question the validity of the Certificate of Compliance issued by PMS for Class 1E fuses that they supplied. Accordingly, licensees may wish to review Class 1E component procurements from this vendor to ensure that appropriate bases exist for the use of the components.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact listed below or the Regional Administrator of the appropriate regional office.

*Charles E. Rossi*  
Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contact: Joseph J. Petrosino, NRR  
(301) 492-0979

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED  
NPC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-18	Malfunction of Lockbox on Radiography Device	4/25/88	All NRC licensees authorized to manufacture, distribute, and/or operate radio- graphic exposure devices.
88-17	Summary of Responses to NRC Bulletin 87-01, "Thinning of Pipe Walls in Nuclear Power Plants"	4/22/88	All holders of OLs or CPs for nuclear power reactors.
88-16	Identifying Waste Generators in Shipments of Low-Level Waste to Land Disposal Facilities	4/22/88	Radioactive waste collection and service company licensees handling prepackaged waste, and licensees operating low-level waste disposal facilities.
88-15	Availability of U.S. Food and Drug Administration (FDA)-Approved Potassium Iodide for Use in Emergencies Involving Radioactive Iodine	4/18/88	Medical, Academic, and Commercial licensees who possess radioactive iodine.
88-14	Potential Problems with Electrical Relays	4/18/88	All holders of OLs or CPs for nuclear power reactors.
88-13	Water Hammer and Possible Piping Damage Caused by Misapplication of Kerotest Packless Metal Diaphragm Globe Valves	4/18/88	All holders of OLs or CPs for nuclear power reactors.
88-12	Overgreasing of Electric Motor Bearings	4/12/88	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License  
CP = Construction Permit



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

June 3, 1988

NRC INFORMATION NOTICE NO. 88-35: INADEQUATE LICENSEE PERFORMED VENDOR AUDITS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert addressees to potential problems resulting from inadequately performed licensee audits at vendor facilities which may not reveal the vendor's failure to implement critical portions of its quality assurance (QA) program. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

NRC reviews during January-April 1988 of documents obtained from Piping Supplies, Incorporated (PSI) of Folsom, New Jersey and West Jersey Manufacturing Company (WJM) of Williamstown, New Jersey identified several inconsistencies that indicate potential generic safety implications with pipe fittings and flanges supplied by PSI and WJM to nuclear power plants. (This issue is discussed further in NRC Bulletin No. 88-05, "Nonconforming Materials Supplied by Piping Supplies, Inc. at Folsom, New Jersey and West Jersey Manufacturing Company at Williamstown, New Jersey.") The NRC inspectors reviewed such typical licensee-auditable manufacturer/supplier records as certified material test reports (CMTRs), certificates of compliance, and heat treat records. The NRC believes the inconsistencies found should have been identified by a licensee during the performance of its own audit.

An NRC inspection on June 10-15 and June 24-28, 1985 at the Nuclear Energy Services Company (NES) at Greensboro, North Carolina identified 22 conditions that did not conform to the NES QA program implementation and one 10 CFR Part 21 violation (reference NRC inspection report 99901018/85-01). The NRC performed these inspections at the request of the Department of Energy to determine the adequacy of the NES QA program relative to the fabrication of canisters to collect, transport, and store the Three Mile Island, Unit 2 core debris. The inspection results raised a concern in regard to the adequacy of the implementation of the QA program at the NES facility in Greensboro, North Carolina because of the collective impact of the numerous deviations from the vendor's program. Before the NRC inspections, General Public Utilities and Bechtel Power Company had jointly performed surveillance activities. On the

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cover sheet of the report the results of the surveillance were summarized as unsatisfactory. However, no nonconformances were issued to NES, nor was the vendor requested to perform any corrective actions other than to develop a specific non-destructive testing examination procedure which, required by contract, should have already been established.

An NRC inspection on November 16-20, 1987 at the Nutherm International Industries, Incorporated (NI) facility in Mount Vernon, Illinois identified six nonconforming areas of implementation failures (reference NRC inspection report 99900779/87-01). Considering a number of identified problems, substantiated allegations, and the breakdown of the QA program in certain areas, the NRC became concerned about the validity of NI's certificates of conformance. Before the NRC audit, inspections had been performed by several licensees. NRC's review of the audit reports produced by licensees indicates that only one licensee identified any deviations, and that that licensee failed to correctly interpret the audit findings.

An NRC inspection on August 25-29, 1986 at the Amerace Corporation facility in Union, New Jersey (Amerace is the manufacturer of Agastat 7000 series timer relays) identified that the vendor had failed to adequately establish and implement a QA program in several areas. One violation of 10 CFR Part 21 and nine nonconformances to the vendor's QA program were identified (reference NRC inspection report 99900296/86-01). The NRC inspection found, in part, that "The failures are indicative of a lack of management involvement in the quality assurance functions...." A review of several audits previously performed by licensees indicated that licensees had identified few or no problems with either the vendor's QA program or its implementation.

An NRC inspection on July 11-12 and August 5-9, 1985 at the Air Balance Incorporated facilities at Westfield, Massachusetts and at Wrens, Georgia found that the vendor had failed to (a) establish a 10 CFR Part 21 program, (b) effectively implement a QA program, and (c) obtain QA program support from management. Two violations of 10 CFR Part 21 and 17 nonconforming items were identified (reference NRC inspection report 99901005/85-01). Again, a review of several audits that licensees had previously performed indicated that licensees had identified few or no problems.

A recent NRC inspection of Elgar Corporation identified several concerns with the vendor's QA program. These include 1) failure to perform independent design review (12 of 55 engineering change notices audited were prepared, reviewed, and approved by the same individual), 2) failure to ensure that the cumulative effects of multiple design changes on an individual drawing did not adversely affect the ability of the equipment to perform its intended function, 3) failure to maintain previous versions of revised drawings, 4) failure to establish duties and authorities of engineering personnel, and 5) failure to perform 10 CFR Part 21 evaluations of identified design errors and deviations. Again, a review of audits licensees had previously performed indicated that these concerns were not identified.

On April 29, 1988, in accordance with the requirements of 10 CFR Part 21, IMO Delaval, Inc. (Delaval) notified the NRC of potential problems with certain engine control devices in the air start, lube oil, jacket water, and crankcase systems in their DSR or DSRV standby diesel generators. In response to a number of reported failures, Delaval performed an audit of the manufacturer of these components, California Controls (Calcon) which identified a concern regarding the implementation of the Calcon QA program. Delaval concluded that there was no objective evidence of product testing having been performed by the sub-vendor. The NRC staff is not certain as to whether any licensees have previously audited Calcon.

Discussion:

The NRC is concerned that the inspections discussed above appear to indicate that licensees may not be adequately implementing their established 10 CFR Part 50 Appendix B program requirements, particularly Criterion VII. Licensees are reminded that it is their responsibility to ensure, by such actions as verifying the validity of and the basis for such manufacturer/vendor records as CMTRs, certificates of compliance, and heat treat records, that purchased equipment and components are able to perform their intended functions. Licensees are further reminded that, as discussed in 10 CFR Part 50 Appendix B Criterion VII, "the effectiveness of the control of quality by contractors and subcontractors shall be assessed by the applicant or designee at intervals consistent with the importance, complexity, and quantity of the product or services." On the basis of the NRC inspections discussed here, it appears that, in some cases, licensee audit efforts have not been effective. The NRC believes that additional attention in this area may be appropriate.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact listed below or the Regional Administrator of the appropriate regional office.

*Charles E. Rossi*  
Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contact: Joseph J. Petrosino, NRR  
(301) 492-0979

Attachment: List of Recently Issued NRC Information Notices

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

July 8, 1988

NRC INFORMATION NOTICE NO. 88-46: LICENSEE REPORT OF DEFECTIVE REFURBISHED  
CIRCUIT BREAKERS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert addressees of licensee reported information that defective refurbished electrical equipment, such as circuit breakers (CBs), may have been supplied to nuclear power plants. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Pacific Gas and Electric Company (PG&E) has informed NRC that it placed a purchase order for 30 new, non-safety-related, molded-case, KHL 36125-type CBs manufactured by the Square D Company (Square D) with a local electrical distributor. These CBs were intended for use in non-safety-related applications at PG&E's Diablo Canyon Nuclear Power Plant.

According to PG&E, the distributor in turn placed the order with a local supplier who bid the lowest price and promised the quickest delivery. The CBs were delivered directly to the Diablo Canyon plant by the supplier; the distributor did not have an opportunity to inspect the CBs. Square D, aware of the purchase order, questioned its failure to receive an order for the unique vintage KHL 36125-type CBs. With PG&E's permission, Square D inspected the CBs and determined that PG&E had been given refurbished, rather than new, CBs. Square D tested and performed detailed examinations of the CBs, and the results reported by PG&E follow.

A. Physical Examination

The yellow side labels used on the CBs were suspect in that the CB model numbers were typed on the labels whereas authentic labels are preprinted. The CBs departed from normal appearance in other respects as well.

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The individual CB cases and each of the CB components appeared to be Square D products; however, the individual CBs incorporated components of different years of manufacture. Each CB bore evidence of having been opened and reassembled.

B. Electric Testing

Square D subjected the CBs to five electrical tests. None of the CBs complied with Square D or Underwriters' Laboratory (UL) specifications for all of the tests, and several of the CBs were out of tolerance on each of the tests. At least four of the CBs failed to trip under circumstances in which they are designed to trip.

Discussion:

In the past, there have been instances in which licensees purchased commercial-grade components, such as CBs, relays, trip units, and other electrical components, from electrical distributors and have received components that did not meet the original purchase order requirements. NRC has received additional information indicating that the problem of surplus or defective refurbished CBs may also apply to CBs sold under other manufacturers' names (e.g., General Electric, Westinghouse, ITE, Cutler Hammer, and Sylvania).

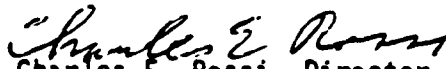
The electrical suppliers involved in refurbishing and sales of circuit breakers, including the Diablo Canyon, Square D circuit breakers, apparently include five California corporations. These companies are (1) General Circuit Breaker & Electric Supply, Inc., (2) HLC Electric Supply Co., Inc., (3) Pencon International, Inc., doing business as General Magnetics/Electric Wholesale, (4) California Breakers, Inc., and (5) Anti-Theft Systems, Inc., doing business as ATS Circuit Breakers and as AC Circuit Breaker-Electrical Supply.

NRC has an investigation and vendor inspection in progress at the above companies. On the basis of the information developed to date, a preliminary list of customers of the five companies including a list of nuclear utilities (where available) is provided in Attachment 1. Attachment 2 contains a list of original equipment manufacturers whose names may have been used on surplus or refurbished equipment sold as new equipment. The information included in Attachments 1 and 2 is only preliminary and is provided to assist licensees in reviewing the potential of having procured suspect electrical equipment at their facilities.

Licensees are reminded of the requirements to ensure that procured items meet the relevant specifications and codes and are suitable for the intended application. Licensees should consider, as a matter of prudence, the need to inquire of and to verify with their authorized distributors the sources of procured materials, equipment, and components. Licensees may meet these requirements by effectively implementing their quality assurance (QA) programs, particularly in the areas of vendor evaluations, vendor surveillances, receipt inspection, bench tests, and post-installation tests.

NRC is gathering additional information to determine what further actions are necessary. The primary purpose of this information notice is to alert addressees of the situation as soon as possible. The NRC is considering issuing a bulletin to followup on this information notice when the NRC has sufficient information to define requirements.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

  
Charles F. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: K. R. Naidu, NRR  
(301) 492-0980

Jaime Guillen, NRR  
(301) 492-1170

Attachments:

1. Preliminary List of Customers (Intermediate Suppliers)  
of Suspect Electrical Equipment
2. Preliminary List of Original Equipment Manufacturers  
Whose Names May Have Been Used on Surplus or  
Refurbished Equipment Sold as New Equipment
3. List of Recently Issued NRC Information Notices

PRELIMINARY LIST OF CUSTOMERS (INTERMEDIATE SUPPLIERS)  
OF SUSPECT ELECTRICAL EQUIPMENT

<u>Organization</u>	<u>Location</u>	<u>Nuclear Utility (if available)</u>
Westinghouse Electric Supply Co. (WESCO)	St. Louis, MO; Boston, MA; Boise, ID; Atlanta, GA; Charleston, SC; Panama, FL; Santa Clara, CA; Fresno, CA; Sacramento, CA; Shreveport, LA; Green Bay, WI; Elk Creek, IL; Albuquerque, NM; Mobile, AL; Ft. Worth, TX; Baton Rouge, LA; Birmingham, AL; East Hartford, CT; Kokomo, IN; Jackson, MS; Milwaukee, WI; Beaumont, TX; Nashville, TN; Skelton, WV; Albany, NY; Hartford, CT; Portland, ME; St. Paul, MN; Minneapolis, MN; other locations	
Power Conversion	Huntington Beach, CA	
Rockwell International	Los Angeles, CA	
Arkansas Power and Light	Little Rock, AR	ANO
Southern California Edison	San Clemente, CA; other locations	SONGS
Phoenix Electric	Phoenix, AZ	
Rensenhouse Electric	Topeka, KS	
Breaker and Control	Houston, TX	
General Electric Company	Baltimore, MD; Houston, TX; Landover, MD; Chantilly, VA; Emeryville, CA; Elmhurst, IL	
Southern Electric Supply Company	Alexandria, LA	
Cleveland Electric Company		

PRELIMINARY LIST OF CUSTOMERS (INTERMEDIATE SUPPLIERS)  
OF SUSPECT ELECTRICAL EQUIPMENT

<u>Organization</u>	<u>Location</u>	<u>Nuclear Utility (if available)</u>
Stokley Enterprises	Norfolk, VA	
Taylor Electric Company	Portland, OR	
Graybar	Ventura, CA; Atlanta, GA	
Hughes Aircraft	El Segundo, CA	
Houston Electric Distribution Company	Houston, TX	
ITE Electrical Products	Atlanta, GA; Knoxville, TN	
Knudson Corporation	Los Angeles, CA	
Georgia Power Company	Milledgeville, GA	



PRELIMINARY LIST OF ORIGINAL EQUIPMENT  
MANUFACTURERS WHOSE NAMES MAY HAVE BEEN USED  
ON SURPLUS OR REFURBISHED EQUIPMENT SOLD AS NEW EQUIPMENT

<u>Manufacturer</u>	<u>Model Number</u>	<u>Equipment Description</u>
Square D	B19.5; B22	Heater for overload relay
General Electric	12HGA11S52	Auxiliary relay
Exide Company	NX400	
Spectro Inc.	V00014	Mercury lamps
Bussman Company	REN15	15-amp 250-V fuse
Bussman Company	NOS-30	30-amp 600-V fuse
(unknown)	FSN 5925-628-0641	Circuit breaker
Westinghouse	DB-50	Trip unit
Westinghouse	DB-25	400-amp circuit breaker
Westinghouse	HKB3150T	Trip unit
Westinghouse	KB3250F	Frame
Westinghouse	FB3020	Circuit breaker
Westinghouse	FB3070	Circuit breaker
Westinghouse	FB3050	Circuit breaker
Westinghouse	EHB3040	Circuit breaker
Westinghouse	EHB3025	Circuit breaker
Westinghouse	LBB3125	Circuit breaker
Westinghouse	HKA31250	Trip unit
Westinghouse	JA3200	Circuit breaker
Westinghouse	EHB2100	Circuit breaker
Westinghouse	CAH3200	Circuit breaker

PRELIMINARY LIST OF ORIGINAL EQUIPMENT  
MANUFACTURERS WHOSE NAMES MAY HAVE BEEN USED  
ON SURPLUS OR REFURBISHED EQUIPMENT SOLD AS NEW EQUIPMENT

<u>Manufacturer</u>	<u>Model Number</u>	<u>Equipment Description</u>
Westinghouse	225N	Navy trip units
ITE	EF-3B100	100-amp circuit breaker
General Electric	AK-2-75-3	Circuit breaker
General Electric	AK-2	Circuit breaker
General Electric	AK-1-50	Circuit breaker
General Electric	AK-1-75	Circuit breaker
General Electric	B; TDQ; TFJ	Circuit breakers
General Electric	TCVVFS	Circuit breaker
ITE	ET; KA	Circuit breakers
Cutler Hammer	--	Circuit breakers
Zinsco/Sylvania	--	Circuit breakers
Bryant	--	Circuit breakers
Murry	--	Circuit breakers
Federal Pacific Electric Company	--	Circuit breakers

LIST OF RECENTLY ISSUED  
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-45	Problems In Protective Relay and Circuit Breaker Coordination	7/7/88	All holders of OLs or CPs for nuclear power reactors.
88-44	Mechanical Binding of Spring Release Device in Westinghouse Type DS-416 Circuit Breakers	6/24/88	All holders of OLs or CPs for nuclear power reactors.
88-43	Solenoid Valve Problems	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-42	Circuit Breaker Failures Due to Loose Charging Spring Motor Mounting Bolts	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-41	Physical Protection Weaknesses Identified Through Regulatory Ef- fectiveness Reviews (RERs)	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-40	Examiners' Handbook for Developing Operator Licensing Examinations	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-39	LaSalle Unit 2 Loss of Recirculation Pumps With Power Oscillation Event	6/15/88	All holders of OLs or CPs for BWRs.
88-38	Failure of Undervoltage Trip Attachment on General Electric Circuit Breakers	6/15/88	All holders of OLs or CPs for nuclear power reactors.
88-37	Flow Blockage of Cooling Water to Safety System Components	6/14/88	All holders of OLs or CPs for nuclear power reactors.
88-36	Possible Sudden Loss of RCS Inventory During Low Coolant Level Operation	6/8/88	All holders of OLs or CPs for PWRs.

OL = Operating License  
CP = Construction Permit

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

JULY 21, 1988

NRC INFORMATION NOTICE NO. 88-46, SUPPLEMENT 1: LICENSEE REPORT OF DEFECTIVE  
REFURBISHED CIRCUIT BREAKERS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice supplement is being provided to present additional information regarding customers of the five California electrical suppliers discussed in NRC Information Notice (IN) No. 88-46 that may have supplied defective refurbished electrical equipment, such as circuit breakers (CBs), to nuclear power plants. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

IN 88-46 discussed a report by Pacific Gas and Electric (PG&E) that defective refurbished CBs were supplied to PG&E's Diablo Canyon Nuclear Power Plant by a California electrical supplier. The IN listed four other California companies involved in refurbishing and supplying possibly defective circuit breakers to nuclear power plants. In addition, the IN provided a preliminary list of customers of the five companies and a list of original equipment manufacturers whose names may have been used on surplus or refurbished equipment sold as new equipment obtained during NRC investigations and vendor inspections in progress at the subject companies.

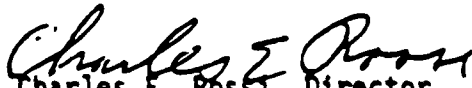
Discussion:

The NRC has obtained additional information from its inspections and investigations related to this issue. Attachment 1 provides a list of shipments of circuit breakers to nuclear power plants or nuclear utilities by the subject electrical suppliers. This list was compiled based on a partial review of records obtained from the five California electrical suppliers discussed in IN 88-46. The majority of the sales were through distributors; however, direct sales and shipments to nuclear utilities have been identified. Except for certain sales to San Onofre for safety-related use, the safety classification of the electrical equipment as sold appears to be commercial grade.

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The NRC is continuing its investigations and review of records on this issue and, if warranted, a further generic communication will be issued.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.



Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: K. R. Naidu, NRR  
(301) 492-0980

Jaime Guillen, NRR  
(301) 492-1170

Attachments:

1. Shipments of Circuit Breakers to Nuclear Power Plants or Nuclear Utilities
2. List of Recently Issued NRC Information Notices

SHIPMENTS OF CIRCUIT BREAKERS  
TO NUCLEAR POWER PLANTS OR NUCLEAR UTILITIES

The following list represents shipments of circuit breakers to nuclear plants or utilities from five suppliers in the Los Angeles area. The majority were sold through distributors; however, direct sales to the utilities are identified. Except for the direct sales to San Onofre, classification of the circuit breakers as sold appears to be commercial grade.

<u>Plant or Utility</u>	<u>Items (Qty)</u>	<u>Date</u>	<u>Sold to and Purchase Order Nos.</u>	<u>Invoice<sup>1</sup></u>	<u>Company<sup>2</sup></u>
Palisades	W EB1020 (2)	9/14/87	WESCO Lansing, MI P03255-87089	I 10995	ATS
Harris	ITE EF3B125(2)	2/9/88	WESCO, Raleigh, NC	WO 24781	CAL BKR
	ITE EF3B125(2)	3/2/88	POs DS3645-80171	WO 25377	CAL BKR
	ITE EF3B125(6)	3/14/88	DS3645-08047	WO 25811	CAL BKR
Dresden	<sup>3</sup> W FA 2100 (2)	12/21/87	WESCO Elmhurst, IL	I 14174	HLC
Quad Cities	W EH 2050 (3)	1/18/88	WESCO Davenport, IA D/S5106-259401	I 14673	HLC
	<sup>3</sup> W EH2070 (1)	3/10/88	WESCO Davenport, IA S05106-M031010	Unknown	GEN BKR
Connecticut Yankee	W HFB 3050 (3)	8/12/87	Economy Elect Manchester, CT DS08127-995428	I 12585	HLC
Mark 860590	W STARTER CONTROLS	6/25/87	06157-730176	I 11752	"
	A200M1CAC (13)		"		"
	A201K1CA (8)		"		"
	A201K2CA (4)		"		"
	AN13A (6)		"		"
	W HFD 3020 (12)	6/16/87	06167-740072	I 11760	"
Braidwood	W MA3600 (1) w/ bell alarm	7/15/86	WESCO Elmhurst, IL	I 07721	"
Ginna	W FA3125 (3)	9/26/84	WESCO Rochester, NY 93095	I 30501	GEN MAG
	W EA2090 (3)	"	"	I 30371	"
	W FA3125 (3)	"	"	"	"
Clinton (Baldwin Associates)	SD Q0220 (10)	7/18/84	WESCO Peora, IL 91586	I 29708	"
Rancho Seco (SMUD)	W JB3100 (2)	8/8/84	WESCO Sacramento, CA 90629	I 29971	"
	W/LINE & LOAD LUGS		SMUD		
	FPE NEF433030 (1)	3/6/87	SMUD RN870356713	I 27290	GEN BKR

<u>Plant or Utility</u>	<u>Items (Qty)</u>	<u>Date</u>	<u>Sold to and Purchase Order Nos.</u>	<u>Invoice<sup>1</sup></u>	<u>Company<sup>2</sup></u>
SONGS	GE TED134030WL (1)	6/10/88	Southern Ca. Edison	I 102174	ECD
	IT BQ2B030	6/9/88	88068300 8W068023	I 102193	ECD
Lilco	FPE NF631100(2)	6/12/86	Graybar Hauppauge, NY(540-BLP901363)	I 7297	HLC
Mississippi Power Co.	W F2020 (1)	1/30/86	WESCO, Mobile, AL DS-3725-860126	I 5585	HLC
PG&E	W EH2100 (1)	3/5/86	AMFAC, Stockton, CA D7232-8980	I 6076	HLC
	FPE NE224060(2)	4/11/88	CED, San Luis Obispo, CA 7605087444D	I 15793	HLC
	W HMC3800F (1)	1/28/88	7605-D76367D	I 14829	HLC
	BMC800 (1LOT)	"	"	"	"
	LUGS (3)	"	"	"	"
	ITE EE3B050(1)	11/3/87	7605D-76116D	I 13783	"
	EE3B030 (1)	"	"	"	"
	W EB3050 (1)	10/2/87	7605-D209190D	I 13333	"
	FPE NE224100 (2)	5/13/88	7605-D87976D	I 16309	"
Detroit Ed.	IT EH3B100 (1)	3/18/88	Detroit Ed. Monroe Pwr plant (190501)	I 11510	ATS
	SD 989316 (2)	11/23/87	Splane Electric Detroit, MI(111275)	WO 02160	ATS
CECo	IT EF3B070	6/3/87	Graybar Melrose Pk, IL (328M502114CS)	I 10684	ATS
	<sup>3</sup> W EH2070 (4)	12/22/87	WESCO Davenport, IA WS5106-258143	I 31399	GEN BKR
Consumers Power Co.	W HDEA2030 (1)	3/30/88	WESCO Lansing, MI DS3255-14766	I 11530	ATS
Southern Cal. Edison	IT FJ3B225 (1)	4/22/88	SCE Construction Forces (117053L)	I 34435	AC BKR
	IT EE3B070 (3)	"	117055L	I 34436	"
	EE2B100 (1)	"	"	"	"
	EE2B050 (2)	"	"	"	"
	EE2B030 (1)	"	"	"	"
	GE TEF134015 (1)	6/15/78	GESCO El Monte, CA	I 11734	HLC
	W EB2030 (2)	5/2/88	Southern Ca. Edison H1238007	I 101586	ECD
	SD SBW-12	1/28/88	Z0048013	I 100384	"
	CONTACTOR (1)	"	"	"	"
	SD LO-3 CONTACTOR(1)	"	"	"	"
VEPCO	IT EF3H050 (1)	6/9/88	Electrical Suplrs Norfolk, VA 1410024000	WO 28849	CAL BKR

<u>Plant or Utility</u>	<u>Items (Qty)</u>	<u>Date</u>	<u>Sold to and Purchase Order Nos.</u>	<u>Invoice<sup>1</sup></u>	<u>Company<sup>2</sup></u>
Carolina Power & Light	IT EF3B125 (2)	2/9/88	WESCO Raleigh, NC DS3645-80171	WO 24781	CAL BKR
	EF3B125 (2)	2/26/88	"	WO 25377	"
	EF3B040 (6)	3/11/88	DS3645-08047	WO 25811	"
Omaha Pub. Pwr Dist	GE THEF136m1100(2)	1/22/85	GESCO Omaha, NE 86687	I 31695	GEN MAG
Boston Ed.	W EH2050 (1)	3/18/85	WESCO Boston, MA	I 32348	GEN MAG
Arkansas Power & Light	IT E42B020 (2)	1/28/88	Treadway Elect. Little Rock, AR 1217D	WO 24372	CAL BKR
	IT QJ2B200 (2)	1/28/88	1215D	WO 24373	"
	GE TEB122015WL (1)	1/28/88	1216D	WO 24376	"
	IT QJ2B200 (2)	2/2/88	1245D	WO 24505	"
	W MCP331000R (4)	2/17/88	1329D	WO 25104	"
	IT QJ2B200 (2)	2/24/88	1357D	WO 25268	"
	GE TEB132090WL (1)	3/1/88	1391D	WO 25485	"
	W MCP431550CR (2)	3/1/88	1392D	WO 25529	"
	W BAB3060H (1)	3/11/88	1464D	WO 25913	"
	SD FAL3650-16M (2)	3/31/88	1589D	WO 26447	"
	IT QJ2B200 (2)	4/8/88	1637D	WO 26707	"
	IT QP1B020 (2)	5/6/88	1754D	WO 27676	"
	GE TE111015 (1)	5/18/88	1805D	WO 28164	"
	IT QJ2B200 (2)	6/7/88	1869D	WO 28757	"
	GE TED134060WL (1)	6/16/88	1930D	WO 29038	"
	W 656D148G03 (1)	3/15/88	1480D	I 52997	"
	MOTOR OPERATOR				
	IT QJ2B200 (2)	6/7/88	1869D	I 53437	"
	GE TEB122050WL (1)	6/30/88	1995D	I 54164	"
	GE THED136100WL (1)	11/30/87	9975D	WO 22497	"
	GE TED126050 (1)	7/15/87	9324D	WO 18318	"
	IT QJ3B200 (3)	7/31/87	9369D	WO 18774	"
	IT QJ2B200 (3)	7/31/87	9369D	WO 18774	"
	GE THED136060WL (2)	8/7/87	9430D	WO 19041	"
	IT QJ3B200 (1)	8/13/87	9473D	WO 19245	"
	GE THGB2120 (3)	8/7/87	9430D	WO 19041	"
	IT QJ3B200 (6)	8/16/87	9424D	WO 19042	"
IT QJ2B200 (10)	8/16/87	9424D	WO 19042	"	



<u>Plant or Utility</u>	<u>Items (Qty)</u>	<u>Date</u>	<u>Sold to and Purchase Order Nos.</u>	<u>Invoice<sup>1</sup></u>	<u>Company<sup>2</sup></u>
Florida Power Corp.	IT JL3B400 (2)	12/23/87	149278	WO 23293	CAL BKR
Houston Power & Light	IT HE9B040 (4)	8/20/87	Aucoin & Miller Houston, TX 0153721	WO 19474	CAL BKR

Notes:

- <sup>1</sup> I - invoice; WO - work order
- <sup>2</sup>
  - ATS - ATS Circuit Breakers, Inc.
  - CAL BKR - California Breakers, Inc.
  - ECD - Electro Components Distributors
  - GEN BKR - General Circuit Breakers and Electrical Supply, Inc.
  - GEN MAG - General Magnetics/Electric Wholesale
  - HLC - HLC Electric Supply Co.
  - AC BKR - AC Circuit Breaker - Electrical Supply
- <sup>3</sup> Shipped to final destination from the distributor

LIST OF RECENTLY ISSUED  
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-51	Failures of Main Steam Isolation Valves	7/21/88	All holders of OLs or CPs for nuclear power reactors.
88-50	Effect of Circuit Breaker Capacitance on Availability of Emergency Power	7/18/88	All holders of OLs or CPs for nuclear power reactors.
88-49	Marking, Handling, Control, Storage and Destruction of Safe- guards Information	7/18/88	All holders of OLs or CPs for nuclear power reactors and all other licensed activities involving a formula quantity of special nuclear material.
88-48	Licensee Report of Defective Refurbished Valves	7/12/88	All holders of OLs or CPs for nuclear power reactors.
88-47	Slower-Than-Expected Rod-Drop Times	7/14/88	All holders of OLs or CPs for PWRs.
88-46	Licensee Report of Defective Refurbished Circuit Breakers	7/8/88	All holders of OLs or CPs for nuclear power reactors.
88-45	Problems In Protective Relay and Circuit Breaker Coordination	7/7/88	All holders of OLs or CPs for nuclear power reactors.
88-44	Mechanical Binding of Spring Release Device in Westinghouse Type DS-416 Circuit Breakers	6/24/88	All holders of OLs or CPs for nuclear power reactors.
88-43	Solenoid Valve Problems	6/23/88	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License  
CP = Construction Permit

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION

July 12, 1988

NRC INFORMATION NOTICE NO. 88-48: LICENSEE REPORT OF DEFECTIVE REFURBISHED VALVES

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert licensees to potential problems with refurbished valves. It is expected that recipients will review this information for applicability to their facilities and consider action, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

In April 1988, Pacific Gas and Electric (PG&E) informed the NRC about a potential problem concerning Vogt 2-inch valves (Vogt Figure No. SW 12111), which were leaking steam at the bonnet and packing. According to PG&E, the valves were purchased from a local supply company in May 1986 and installed in non-safety-related applications. Although the supply company is now out of business, additional information was obtained by PG&E that indicated that the valves, although supplied as new, were actually shipped from CMA International of Vancouver, Washington, a valve salvage supply house. Henry Vogt Company examined the valves at the Diablo Canyon plant and determined that it had not manufactured the valves. The valves at Diablo Canyon had square flanges, and all Vogt-manufactured valves have round flanges.

Discussion:

NRC again stresses the importance of the licensee's role in ensuring that procurement activities for both safety-related and non-safety-related components and materials are given attention commensurate with their importance. Had an adequate review of the source of the valves been performed, this problem would have been identified and salvage valves would not have been installed.

On the basis of discussions with Vogt representatives, these valves would not be appropriate as replacement valves in safety-related applications. These valves are full-port design; that is, the valve port is the same size as the

inside diameter of the pipe. Vogt valves designed and sold for safety-related use are standard-port design; that is, the valve port is slightly smaller than the inside diameter of the pipe. Vogt representatives were not aware of any full-port design valves sold for safety-related applications to nuclear power plants.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact listed below or the Regional Administrator of the appropriate regional office.

*Charles E. Rossi*

Charles E. Rossi, Director  
Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contact: Edward T. Baker, NRR  
(301) 492-3221

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED  
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-47	Slower-Than-Expected Rod-Drop Times	7/14/88	All holders of OLs or CPs for PWRs.
88-46	Licensee Report of Defective Refurbished Circuit Breakers	7/8/88	All holders of OLs or CPs for nuclear power reactors.
88-45	Problems In Protective Relay and Circuit Breaker Coordination	7/7/88	All holders of OLs or CPs for nuclear power reactors.
88-44	Mechanical Binding of Spring Release Device in Westinghouse Type DS-416 Circuit Breakers	6/24/88	All holders of OLs or CPs for nuclear power reactors.
88-43	Solenoid Valve Problems	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-42	Circuit Breaker Failures Due to Loose Charging Spring Motor Mounting Bolts	6/23/88	All holders of OLs or CPs for nuclear power reactors.
88-41	Physical Protection Weaknesses Identified Through Regulatory Ef- fectiveness Reviews (RERs)	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-40	Examiners' Handbook for Developing Operator Licensing Examinations	6/22/88	All holders of OLs or CPs for nuclear power reactors.
88-39	LaSalle Unit 2 Loss of Recirculation Pumps With Power Oscillation Event	6/15/88	All holders of OLs or CPs for BWRs.
88-38	Failure of Undervoltage Trip Attachment on General Electric Circuit Breakers	6/15/88	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License  
CP = Construction Permit

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

December 16, 1988

NRC INFORMATION NOTICE NO. 88-97: POTENTIALLY SUBSTANDARD VALVE  
REPLACEMENT PARTS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert addressees about reports concerning the manufacture and distribution of valve replacement parts for Masoneilan-Dresser Industries (M-D) valves that were determined not to be genuine M-D parts and possibly are substandard. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

On October 21, 1988, Consumers Power Company (CPCo) submitted a 10 CFR Part 21 report to the NRC regarding valve internals for M-D valves that were found not to be manufactured by an authorized M-D manufacturer. CPCo reported that it had identified approximately 65 questionable valve internals (e.g., valve stems, plugs/discs, cages, seat rings, and retainer pins) after an M-D field service representative pointed out that several valve internal parts for an M-D turbine bypass valve at CPCo's Palisades Nuclear Plant were not genuine M-D parts.

Discussion:

During the 1986 Palisades refueling outage, CPCo sent the subject turbine bypass valve to an M-D authorized facility for refurbishment after experiencing leakage problems with the valve. CPCo also sent to the M-D authorized facility the valve replacement parts since the parts were in-stock items at the Palisades warehouse. After the valve was refurbished and reinstalled, CPCo continued to experience leakage problems with the valve. However, CPCo decided to continue operating with the leakage and to wait until the 1988 refueling outage to resolve the problem.

8812120047

During the 1988 refueling outage, CPCo decided to perform the valve refurbishment at the Palisades plant and requested onsite technical support from M-D. During the valve disassembly process, the M-D field service representative pointed out that some of the valve internals had different dimensional and metallurgical characteristics from typical M-D parts. The installed parts had been provided by CPCo and installed in the bypass valve at the authorized M-D facility during the 1986 outage. The M-D representative also identified additional valve internal parts in the Palisades warehouse that he stated were different from typical M-D parts. CPCo believes that all the parts came from the same purchase order. Subsequent CPCo investigations determined that the authorized M-D distributor procured some of the valve parts from manufacturers that are not authorized to make M-D parts.

On November 18, 1988, M-D transmitted a letter to the NRC regarding this issue (Attachment 1) indicating that a potential for malfunction of M-D valves exists if parts manufactured by unauthorized companies are installed.

The 10 CFR Part 21 notification submitted by CPCo, the attached M-D letter, and the NRC staff reviews have brought into question the ability of a valve to perform its safety-related function when internal parts are substandard to the valve manufacturer's authorized replacement parts. Accordingly, addressees may wish to review whether they have an adequate basis for accepting valve replacement parts, especially those purchased for safety-related applications, and to contact the appropriate manufacturers or distributors to confirm the authenticity of any questionable parts.

No specific action or written response is required by this information notice. If you have any questions regarding this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

  
Charles E. Rossi, Director

Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation

Technical Contacts: Joe Petrosino, NRR  
(301) 492-0979

Jaime Guillen, NRR  
(301) 492-1170

Attachments:

1. Letter to NRC from M-D
2. List of Recently Issued NRC Information Notices

**Masoneilan****DRESSER**

MASONEILAN NORTH AMERICAN OPERATIONS  
85 Bodwell Street • Avon, Massachusetts 02322  
508/586-4600 • Telex: 92-4410

Attachment 1  
IN 88-97  
Page 1 of 2

November 18, 1988

Nuclear Regulatory Commission  
Office of Nuclear Reactor Regulation  
Washington, D.C. 20555

Attention: Mr. Brian Grimes  
Director, Division of Reactor  
Inspection and Safe Guards

Subject: 10CFR21 Report Masoneilan Valve Parts Deficiencies  
Docket 50-255 License DPR-20-Palisades

Dear Mr. Grimes:

This letter is to inform the USNRC of the potential for counterfeit Masoneilan parts being supplied to Commercial Nuclear facilities.

On October 21, 1988, a 10CFR21 report was filed to the USNRC by Consumers Power (ref. Docket 50-255, License DPR-20 Palisades Plant). In that report, valve parts purported to be of Masoneilan manufacture were in fact manufactured by unauthorized sources. These counterfeit parts were supplied by an authorized Masoneilan representative in violation of Masoneilan policy and on their own initiative. These parts were not manufactured to Masoneilan standards and the potential for subsequent valve malfunction exists. All identified parts have been segregated and are being replaced.

Because of this unauthorized action, an evaluation must be performed by the plant licensees, to determine if this is an isolated occurrence.

In this case, Non-Q parts procured commercially were dedicated into Q valves. On site service by Masoneilan personnel identified several parts of other than Masoneilan manufacture.

Counterfeit parts identified at this plant were:

- Plug stem
- Stem to plug anti-rotation pin
- Seat ring



SUBJECT: 10CFR21 Report Masoneilan Valve Parts Deficiencies

PAGE 2

In addition the potential for additional counterfeit parts exists in the realm of turned machine parts such as:


- Valve plugs
- Bushings
- Cages
- Packing box components

Counterfeit machined parts are often difficult to distinguish from original equipment parts.

An independent investigation by Masoneilan is under way to determine if similar circumstances have occurred with other Masoneilan representative organizations. We are auditing the Manufacturer's representatives with a significant installed base of Masoneilan valves in Nuclear Power facilities in various geographical territories.

Our concern is for the potential of other similar circumstances in Nuclear Power facilities.

Very truly yours,  
MASONEILAN-DRESSER INDUSTRIES



---

W.T. Allen  
Quality Manager  
Masoneilan North American Operations

WTA/mk

cc: L.W. Kinderman  
J.E. Conway  
R. Cameron

LIST OF RECENTLY ISSUED  
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-96	Electrical Shock Fatalities at Nuclear Power Plants	12/14/88	All holders of OLs or CPs for nuclear power reactors.
88-95	Inadequate Procurement Requirements Imposed by Licensees on Vendors	12/8/88	All holders of OLs or CPs for nuclear power reactors.
88-94	Potentially Undersized Valve Actuators	12/2/88	All holders of OLs or CPs for nuclear power reactors.
88-93	Teletherapy Events	12/2/88	All NRC medical licensees.
88-92	Potential for Spent Fuel Pool Draindown	11/22/88	All holders of OLs or CPs for nuclear power reactors.
88-91	Improper Administration and Control of Psychological Tests	11/22/88	All holders of OLs or CPs for nuclear power reactors and all fuel cycle facility licensees who possess, use, import, export, or transport formula quantities of strategic special nuclear material.
88-90	Unauthorized Removal of Industrial Nuclear Gauges	11/22/88	All NRC licensees authorized to possess, use, manufacture, or distribute industrial nuclear gauges.
88-89	Degradation of Kapton Electrical Insulation	11/21/88	All holders of OLs or CPs for nuclear power reactors.
88-88	Degradation of Westinghouse ARD Relays	11/16/88	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License  
CP = Construction Permit