NIRS

Nuclear Information and Resource Service

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December 15, 1992

James Taylor
Executive Director of Operations
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Taylor:

Enclosed is a petition presented under the provisions of 10 CFR 2.206.

We would appreciate a response to this petition at your earliest possible convenience, and certainly by January 15, 1993.

Thank you for your cooperation.

Sincerely,

Michael Mariotte
Executive Director

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Nuclear Information & Resource Service

v.

United States Nuclear Regulatory Commission

1. The Nuclear Information and Resource Service (NIRS) presents this petition under the provisions of 10 CFR 2.206.

2. We ask that the Nuclear Regulatory Commission (NRC) staff show cause as to why the operating and/or construction licenses of 82 nuclear power reactors--those which use Thermo-Lag as a fire barrier material--should not be immediately suspended. A full list of the atomic reactors involved is enclosed.

3. The NRC staff already has denied NIRS' petition of July 21, 1992 and addendum of August 12, 1992. The NRC Commissioners denied a September 3, 1992 appeal of these petitions on November 9, 1992. We note, however, that the Commissioners chose not to review our September 3 petition, and did not address it on substantive grounds. Further, we note that the September 3 appeal argued that the NRC staff had not adequately addressed the technical issues presented in our earlier petitions. This current petition contains new information, both on many of the issues we raised earlier (paragraph 10) and on new issues relating to Thermo-Lag (paragraph 11). We believe this warrants a full review of our earlier petitions and a thorough examination of the current petition.

4. The denial of these petitions and appeal has been arbitrary and capricious. The NRC must address the technical issues raised in these petitions; it is not sufficient for the NRC to merely assert that compensatory measures are in place, therefore there is nothing to worry about. Compensatory measures must provide an equivalent level of protection as compliance with the regulations; in this case they clearly do not. We recognize that the NRC has the right to deny 2.206 petitions. Indeed, we believe that the NRC must think it is law that it must deny such petitions. What else could explain its denial of at least the past 93 petitions of 93 submitted? Can petitioners never be correct? The NRC does not have the right, however, to deny 2.206 petitions which raise specific technical issues without addressing those issues.

5. NIRS has raised specific technical issues, and made specific allegations, about the inadequacy of Thermo-Lag as a fire barrier and its inability, through independent testing, to meet the NRC's own fire protection regulations (Section 50.48(A) of Title 10 of the Code of Federal

Regulations requires that each operating nuclear power plant have a fire protection plan that satisfies Appendix A to 10 CFR Part 50, General Design Criteria 3, "Fire Protection." 10 CFR Part 50 Appendix R rquires such fire protection plans for reactors receiving operating licenses after January 1, 1979 and Appendix A to BTP 9.5-1 for all plants licensed prior to January 1, 1979.). The NRC's own independent Inspector General, in a report released August 17, 1992 confirmed many of NIRS' allegations and added new information as well. The NRC staff has acknowledged the shortcomings of Thermo-Lag by declaring it "inoperable" and ordering "compensatory" measures consisting of fire watches at all nuclear plants which use Thermo-Lag.

6. The NRC has not, however, answered several of NIRS' specific allegations or responded to information which calls into serious question the adequacy of "compensatory" measures, or the ability of Thermo-Lag to ever meet NRC fire protection criteria. For example, we pointed out past instances, at Comanche Peak and Seabrook, of inattentive fire watch personnel and falsification of fire watch logs. The compensatory fire watches ordered by the NRC already have resulted in at least one instance of vandalism by a fire watch employee, in which insulation was torn up, graffiti written on a plant door, a fire hose uncoiled and filled with water, etc. (PN39256, October 16, 1992). The employee's reason for the vandalism: "boredom." NIRS submits that as the Thermo-Lag issue drags on (by the NRC's 1995 target date for resolution, it would involved over 200 reactor-years), such instances, and the accompanying lower levels of protection, will increase.

7. In addition, the NRC staff has proposed changing test criteria to ensure Thermo-Lag passes fire protection tests, rather than forcing the material to meet industry standard test criteria already passed by competing products. Indeed, the test criteria proposed by the NRC staff offers no possibility of failure; instead, even if a fire barrier material fails every conceivable test, "engineering evaluation" will be used to allow its continued use. This gives the appearance of favoritism toward Thermo-Lag and its manufacturer, Thermal Science, Inc.

We note that the E-119 test currently used by the NRC to determine fire barrier adequacy is already the weaker of two standard tests commonly used for fire barriers. The U.L.1709 Smithers high-rise test is far more challenging to fire barriers and represents combustible loads (for example, catastrophic emergency diesel generator fire) conceivable for nuclear power plants. We allege that Thermo-Lag could not pass this test, but competing products (e.g., 3-M, Promat) can and have passed this test.

8. Further, the NRC staff has proposed a Thermo-Lag "Action Plan" which would not fully resolve outstanding fire protection issues and regulatory violations until May, 1995, if then. This is an absurd time span to place the public's health and safety in serious danger for a situation which is in acknowledged violation of NRC regulations. This represents a dereliction of duty, and, if a fire should occur at a nuclear plant during this period, could represent gross negligence.

9. The NRC has consistently attempted to downplay the safety significance of the Thermo-Lag issue, both to NIRS (August 19, 1992 denial of 2.206) and to Congress (letter from Chairman Ivan Selin to Hon. John Dingell, August 19, 1992, "the staff considers the relative safety significance...to be low"; Thermo-Lag concerns "do not pose an immediate threat to public health and safety." Concluding a November 13, 1992 staff briefing to the Commissioners, Chairman Selin said, "Well, this is a mess. There's no question about it. Having gotten into the

mess, obviously we don't want to make it any worse. But we've just got to be very careful with each step that we don't jump a step through wishful thinking or just fatigue on this point. I don't want to tell you what I think of this topic, but I'm wearing Mickey Mouse cufflinks today." This is an obvious demeaning of the issue, and shows a clear lack of understanding of the safety concerns involved.

As the NRC Inspector General's report released August 17, 1992 points out, "...the Commission determined that only three items in Appendix R were of such safety significance that they should apply to all plants." (emphasis added) This included Section III.G, the requirement to protect redundant safe shutdown systems, either by horizontal separation or by fire barriers. The IG's report also noted that when the NRC first proposed its fire protection rules, the agency stated that while chances of a fire are low, "the potential consequences of fire are serious." In fact, the Thermo-Lag issue is one of high safety significance, and not just on a long-term basis. As we note above, the NRC's proposed Action Plan is not scheduled to fully resolve this issue for more than 200 reactor years, or the equivalent full lifetimes of at least five reactors. As we have repeatedly noted, NUREG-1150, the NRC's basic reactor safety document, predicts three to four significant fires in each reactor's operating lifetime and that if there is a core meltdown, there is as much as a 50% chance it was caused by fire. The NRC cannot simply take its own sweet time on this serious safety issue.

10. NIRS now presents those technical issues previously raised by NIRS to which the NRC has not responded. In paragraph 11, we will present new technical concerns.

A. Toxicity. In its three petitions (July 21, August 12, and September 3, 1992), NIRS alleged that the burning of Thermo-Lag can release highly toxic gases, specifically hydrogen cyanide and carbon dioxide. Because of its ampacity derating problems (addressed below), Thermo-Lag can actually be the instigator of fires. The "compensatory" measures the NRC has instituted to "temporarily" address the Thermo-Lag problem consists of fire watches--plant workers who regularly tour the plant looking for evidence of fire. It is NIRS' contention that, should a fire in a Thermo-Lag protected area occur, whether instigated by Thermo-Lag or other factors, fire watch personnel could be overcome by toxic fumes and fail to be able to sound an appropriate alarm or otherwise respond appropriately to fire. Indeed, we contend that their health and safety could be placed at inappropriate risk.

In its August 19, 1992 response to NIRS' petition, the NRC staff asserted that its testing found that the burning of Thermo-Lag creates no more toxic gases than a "Douglas Fir." We're not sure what that's supposed to mean, we wouldn't really want to be in a small compartment containing electrical cables with a burning Douglas Fir ourselves, but in our September 3, 1992 appeal, we submitted a report of a test performed by a nationally-recognized independent testing laboratory (Southwest Research Institute) which concluded "It is a certainty that animals, if employed during the tests reported here, would have survived only briefly in the atmospheres produced by the thermal decomposition" of Thermo-Lag.

The NRC Commissioners did not respond to this valid technical information. We ask the staff to do so at this time. If the staff's tests have shown that the burning of Thermo-Lag does not produce toxic fumes, we can think of only three possibilities:

(1) One of the tests is wrong. This seems unlikely. Both NTIS (the NRC's test source) and Southwest Research Institute are nationally-recognized testing laboratories. In the case of Southwest Research, two separate tests were done, with slightly varying but similar results.

(2) TSI's quality assurance program is so poor that samples of wildly different compositions

were provided to the two testing laboratories.

(3) The Promatec test (by Southwest Research) submitted by NIRS was conducted in 1986; the NTIS NRC tests was conducted in 1992. We believe it plausible that the composition of Thermo-Lag has changed during those years. If so, however, TSI has not told anyone of the change in composition, nor has it submitted the new composition to required testing for fire barriers.

If either (2) or (3) are correct, the NRC must immediately suspend the operating licenses of all nuclear reactors using Thermo-Lag, since it can have no assurance whatsoever that Thermo-Lag, as installed, meets any fire protection requirement. Further, if number (2) is correct or for any other reason the Promatec report submitted by NIRS is correct, the "compensatory" measures (fire watches) instituted by the NRC are placing plant personnel in grave danger from exposure to highly toxic fumes.

B) Seismicity. The NRC has not responded to NIRS' allegation that Thermo-Lag does not meet seismic criteria required under 10 CFR 50 Part 100 and BTP 9.5-3. NIRS contends that Thermo-Lag cannot, through testing, meet such criteria. Further, NIRS notes that competing fire barrier products, such as 3-M, Promat, Hymec, have passed seismic tests. Finally, NIRS notes that the NRC staff has not proposed seismic testing as part of its revised testing program for approval of fire barrier materials. Such testing (along with toxicity testing) must be a part of any testing program.

C) Combustibility. The NRC has not responded to NIRS' allegation that Thermo-Lag is combustible, contrary to 10 CFR 50 Appendix A and R. The NRC's own testing (and dramatic color photographs) indicate that Thermo-Lag is indeed combustible. We understand, however, that the NRC is preparing an Information Notice acknowledging Thermo-Lag's combustibility. Further, we understand the NRC may require utilities to consider Thermo-Lag in their analysis of fire loads. It would indeed be ironic to have the fire protection material listed as part of the fire protection problem. Moreover, Thermo-Lag is often used in areas required to be free of combustible materials. This is itself is evidence of an uncorrectable regulatory violation and by itself should require removal of all Thermo-Lag material from use as fire barriers.

D) Ampacity Derating. While acknowledging the problems caused by incorrect ampacity derating of Thermo-Lag, the NRC has not yet taken steps to address this issue.

E) Hose Stream. The NRC staff, in its proposed fire barrier testing criteria, incorrectly would allow use of fog nozzle, rather than full-force hose stream tests. ASTM E-119, the standard fire test used by the NRC and passed by other products, requires a full-force hose stream test. We also note that the new, as-yet-unnumbered ASTM test for electrical raceways also would require a full hose stream test. This again shows the appearance of unwarranted favoritism toward Thermal Science, Inc.

11. A) NIRS recently has learned that Thermo-Lag contains voids, or, in laymen's terms, areas where there is essentially a front and back to the material, but no or little middle. These voids were found at Comanche Peak-2, and are confirmed in a memorandum of an October 20, 1992 phone conversation between Rubin Feldman of TSI and Frank Muraglia of the NRC, as well as follow-up letter of November 7, 1992 from Feldman to Muraglia. The NRC's own NIST tests already have confirmed that Thermo-Lag can burn through in remarkably little time. Where

voids exist, burn-through could occur very rapidly, negating the material's effectiveness as a fire barrier. Further, the presence of voids would make enhancements to Thermo-Lag, intended to meet the proposed revised weaker NRC testing requirements, meaningless. In base terms, where there is virtually no material, there is virtually no fire barrier.

There is no reason whatsoever to believe that the voids found at Comanche Peak are an isolated instance. It must be assumed that voids exist in Thermo-Lag installed at every nuclear plant. This has two serious implications: 1) it is impossible to prove, even through testing, that Thermo-Lag can meet fire protection standards. Unless every piece of Thermo-Lag installed is tested--a destructive test impossible to conduct--there can be no confidence that voids do not exist which would negate test results; 2) "compensatory" fire watches, even on an hourly basis, may not be able to detect or respond to a fire, spurred by quick-burning voids, within a reasonable time period. Thus, the NRC's "compensatory" measures are, by definition, inadequate, and cannot meet the spirit, intent, or letter of regulation.

B) NIRS believes that at least some voids may be created by "bending" the Thermo-Lag material around electrical conduits. We believe that it has been common practice to "bend" this material around conduits, which causes it to crack, and then to staple the material together and cover it with another layer of Thermo-Lag. Besides the problem of this practice potentially creating voids, we contend that the staples may serve as a "heat sink," soaking up heat and directing it to the weakest areas of the material, thus causing combustibility and speedy failure of the material.

C) NIRS recently has learned that TSI may have erred in informing utilities about the weight of Thermo-Lag as installed. This is important, because cable trays and conduits supported by hangars and other supports often have very little room for error in calculating weight loads. Rather than the 78.5 lbs/cu.ft. figure used by TSI (and we understand some utilities may have used even lower figures), as installed actual weights may vary from 92.5 lbs/cu.ft. to as much as 140 lbs/cu.ft.

12. NIRS contends that the NRC has acted in an arbitrary and capricious manner by denying NIRS' petitions of July 21, August 12, and September 3, 1992 without adequately addressing the serious technical issues described above. NIRS offers this opportunity for the NRC to address these issues.

13. Relief Requested. NIRS requests the immediate suspension of the operating and/or construction licenses of all nuclear power plants which use the material Thermo-Lag as a fire barrier, until the Thermo-Lag is removed and replaced.

Alternatively, NIRS requests that the NRC order each reactor to remove and replace its Thermo-Lag during its next refueling outage, or before beginning operation.

Respectfully submitted,

Michael Mariotte
Executive Director
Nuclear Information & Resource Service
December 15, 1992

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THE 84 REACTORS WHICH USE THERMO-LAG

Reactor	Utility	State
Arkansas 2	Arkansas Power & Light	AR
Beaver Valley 1 & 2	Duquesne Light	PA
Braidwood 1 & 2	Commonwealth Edison	IL
Browns Ferry 1, 2 & 3	TVA	AL
Brunswick 1 & 2	Carolina Power & Light	NC
Byron 1 & 2	Commonwealth Edison	IL
Callaway	Union Electric	MO
Clinton	Illinois Power	IL
Comanche Peak 1 & 2	Texas Utilities	TX
Cook 1 & 2	Indiana & Michigan Elec.	MI
Cooper	Nebraska Public Power	NE
Crystal River	Florida Power	FL
Davis Besse	Toledo Edison	OH
Diablo Canyon 1 & 2	Pacific Gas & Electric	CA
Duane Arnold	Iowa Electric	IA
Fermi 2	Detroit Edison	MI
Grand Gulf	Mississippi P&L	MS
Haddam Neck	Connecticut Yankee	CT
Hatch 1 & 2	Georgia Power	GA
Indian Point 2	Consolidated Edison	NY
LaSalle 1 & 2	Commonwealth Edison	IL
Limerick 1 & 2	Philadelphia Electric	PA
Maine Yankee	Maine Yankee	ME
McGuire 1 & 2	Duke Power	NC
Millstone 1, 2 & 3	Northeast Utilites	CT
Monticello	Northern States Power	MN
Nine Mile Point 1 & 2	Niagara Mohawk	NY
North Anna 1 & 2	Virginia Power	VA
Oyster Creek	Jersey Central	NJ
Palisades	Consumers Power	MI
Palo Verde 1, 2 & 3	Arizona Public Service	AZ
Peach Bottom 2 & 3	Philadelphia Electric	PA
Perry	Centerior	OH
Prairie Island 1 & 2	Northern States Power	MN
River Bend	Gulf States Utilities	LA
San Onofre 2, & 3	Southern Calif. Edison	CA
Sequoyah 1 & 2	TVA	TN
Shearon Harris	Carolina Power & Light	NC
South Texas 1 & 2	Houston Light & Power	TX
St. Lucie 1 & 2	Florida Power & Light	FL
Summer	SC Electric & Gas	SC

Surry 1 & 2	Virginia Power	VA
Susquehanna 1 & 2	Pennsylvania P&L	PA
Three Mile Island 1	GPU Nuclear	PA
Trojan	Portland Gas & Electric	OR
Turkey Point 3 & 4	Florida Power & Light	FL
Vermont Yankee	Vermont Yankee	VT
Vogtle 1 & 2	Georgia Power	GA
Waterford 3	Louisiana P&L	LA
Watts Bar 1 & 2	TVA	TN
Wolf Creek	Kansas Gas & Electric	KS
WPPSS 2	WPPSS	WA
Zion 1 & 2	Commonwealth Edison	IL

Note: Comanche Peak 2 and Watts Bar 1 & 2 are still under construction.

Source: NRC and utility documents