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PETITION RULE PRM-50-32 (47 FR 20)

January 22, 1983

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PETITION RULE PRM-50-32A
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(47 FR 53030)

Secretary of the Commission
ATTN: Docketing & Service
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Additional Comments on PRM-50-32 (47 FR 53030, Nov. 24, 1982)

The undersigned OCRE Representative, having reviewed the comments previously submitted on OCRE's PRM-50-32 during the earlier comment period, wishes to address some of the apparent misconceptions expressed by those commenters.

First, some commenters believe that electromagnetic pulse (EMP) is of minor consequence compared with the other destructive effects of nuclear weapons and warfare. Albeit true, this viewpoint ignores the fact that only one nuclear detonation, high in the atmosphere, producing no blast, heat, or radiation effects on the earth, could bathe the entire country in EMP. Full-scale nuclear war is not a prerequisite for EMP. This is pointed out in an article in the Jan/Feb issue of Science 83, pp. 40-49, to which OCRE would call the Commission's attention. The U.S. Defense Department is taking EMP seriously (as evidenced by a $20 billion budget for EMP hardening), and so should the Commission and the nuclear industry.

Many industry commenters quoted 32 FR 13445 (Sept. 19, 1967). It is the fundamental thrust of PRM-50-32 that these statements are simply erroneous, especially with respect to EMP. Especially flawed is the statement that "(t)he circumstances which compel this recognition are not, of course, unique as regards a nuclear facility; they apply also to other structures which play vital roles within our complex industrial economy." Ignored therein is the fact that nuclear reactors are not just another part of the economy that is vulnerable to destruction during warfare, but are potential sources of destruction in and of themselves. In 1967 the Commission, given the state of knowledge of EMP, was justified in considering this additional destructive factor minor in comparison with that of a full-scale nuclear war. There is no such excuse now. EMP presents a unique situation. One nuclear blast could unleash that destructive force while leaving other industries (none of which possess the destructive potential of nuclear power plants) untouched.

EMP vulnerability makes the U.S. nuclear power program inimical to the common defense and security of the nation. Note that this consideration is specifically addressed by 10 CFR 50.57(a)(6). The Commission has the power to suspend or revoke licenses if conditions are revealed that would warrant refusal to grant a license in the first place (10 CFR 50.100). The Commission also has the authority to order backfitting of facilities if such is warranted for the public health and safety or common defense and security (10 CFR 50.109(a)). Since the common defense and security of our nation is within the authority of the Commission, 10 CFR 50.13 must be amended so that the Commission can exercise its authority with respect to the threat

cc:
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posed by EMP. [illegible]

Some commenters questioned whether the design changes and backfitting necessary to harden nuclear plants against EMP are justified. OCRE believes that the Commission's recently approved safety goal indeed gives such justification. Using the figures from the Sandia Reactor Accident Consequences study (see attached chart), and assuming a nuclear detonation in space or in the upper atmosphere such that the entire United States is bathed in EMP, and assuming that all the nuclear plants listed on the chart are operational, and that the EMP induces core melting and containment failure, along with whatever other assumptions are inherent in the Sandia study, a total of 1,443,242 early deaths will occur, along with 5,485,310 early injuries. Using an estimate of 600 rems whole body for the early deaths and 200 rems for the early injuries, there would be a total (both deaths and injuries) of 1.963×10^9 person-rems exposure resulting from the EMP-induced accidents. Multiplying by the $1000/person-rem value in the safety goal gives $\$1.963 \times 10^{12}$. Therefore, the expenditure of $2 trillion for EMP hardening of nuclear power plants is justified. This is, of course, ignoring the total estimated costs of $12 trillion, as indicated by the Sandia chart, resulting from nuclear accidents.

The Science 83 article gives information suggestive of the costs of EMP hardening. A Boeing 747 was hardened, built from scratch, at a cost of 5 times that of a commercial plane. Using that figure as a guideline, OCRE suspects that hardening of nuclear plants can be accomplished for less than the $2 trillion limit of the safety goal. A 1000 MWe nuclear power plant costs about $2 billion to build. Five times that cost (for EMP protection) is $10 billion. Assuming that 130 plants would have to each spend this amount gives a total figure of $1.3 trillion, less than the amount dictated by the safety goal. These figures are, of course, speculative. Actual costs may well be less, since only a few key systems may need hardening in a nuclear power plant (as opposed to the plane).

Obviously more understanding is needed of the exact nature of EMP and its effects on nuclear reactors. The Science 83 article indicates that these may be complex and that there are other, similar effects of nuclear weapons that need to be studied. OCRE is aware that Sandia National Laboratories is performing a study of EMP effects on nuclear plants, and OCRE wishes to be kept informed of this and any other information on EMP and OCRE's petition which the Commission may possess.

Until the full story on EMP is known, a wise course of action may be to order the shutdown of all nuclear plants, given increasing world hostilities and saber-rattling of the current administration. This should not be hard for the Commission if it truly believes that its mission is to regulate licensees to the extent necessary for the protection of the public.

Finally, OCRE would address the remarks made by some industry commenters that PRM-50-32 is no more than a dilatory and self-serving move made by OCRE. Specifically, WPPSS requests that OCRE be suspended as an intervenor in the Perry OL proceeding. OCRE's only motives, both in the Perry proceeding and PRM-50-32, are that the public health and safety be protected and that truth and justice prevail in the Commission's actions. (These should be the Commission's goals as well.) WPPSS, which is not even a party in the Perry proceeding, is in no position to judge OCRE's interests. If, in the course of this rulemaking, any limitations are placed on OCRE's standing in the Perry proceeding as a consequence of such comments, OCRE will not hesitate to take legal action against the Commission and against WPPSS.

Respectfully submitted,

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PLANT/LOCATION	PEAK EARLY DEATHS*	PEAK EARLY INJURIES*	PEAK EARLY RADIUS IN MILES*	PEAK INJURY RADIUS IN MILES*	SCALED FINANCIAL CONSEQUENCES IN BILLIONS
Arkansas 1(O), Russellville, Ark.	2,530	6,010	17.5	35	$48.1
Arkansas 2(O), Russellville, Ark.					84.9
Beaver Valley 1(O), Shippingport, Pa.	24,400	271,000	30	55	127.8
Bellefonte 1(C), Scottsboro, Ala.	3,300	6,900	30	30	84.1
Bellefonte 2(C), Scottsboro, Ala.					82.7
Big Rock Point 1(O), Charlevoix, Mich.	3,450	6,030	12.5	40	13.2
Braidwood 1(C), Joliet, Ill.	6,730	63,300	15	60	127.9
Braidwood 2(C), Joliet, Ill.					122.9
Browns Ferry 1(O), Decatur, Ala.	19,400	47,700	20	30	67.3
Browns Ferry 2(O), Decatur, Ala.					69.1
Browns Ferry 3(O), Decatur, Ala.					73.0
Brunswick 1(O), Brunswick, N.C.	18,100	33,700	30	45	56.5
Brunswick 2(O), Brunswick, N.C.					53.9
Byron 1(C), Rockford, Ill.	9,930	79,300	15	60	114.0
Byron 2(C), Rockford, Ill.					114.0
Calvert Cliffs 1(O), Lusby, Md.	7,090	23,900	20	35	87.4
Calvert Cliffs 2(O), Lusby, Md.					92.0
Catawba 1(C), Rock Hill, S.C.	41,900	87,600	30	30	101.0
Catawba 2(C), Rock Hill, S.C.					93.7
Clinton 1(C), Clinton, Ill.	1,940	44,700	15	60	92.8
Cook 1(O), Bridgman, Ill.	1,210	13,800	25	35	117.0
Cook 2(O), Bridgman, Ill.	2,060	92,700	15	70	91.9
Cook 3(O), Bridgman, Ill.					101.0
Cooper 1(O), Brownville, Neb.	2,270	5,470	25	35	57.3
Crystal River 3(O), Red Level, Fla.	1,160	6,630	20	55	53.8
Davis Besse 1(O), Oregon, Ohio	1,790	110,000	15	70	84.0
Diablo Canyon 1(O), San Luis Obispo, Calif.	48,600	12,400	17.5	35	155.0
Diablo Canyon 2(O), San Luis Obispo, Calif.					138.0
Dresden 1(O), Morris, Ill.	36,600	71,400	15	60	23.5
Dresden 2(O), Morris, Ill.					87.4
Dresden 3(O), Morris, Ill.					89.6
Duane Arnold 1(O), Palo, Iowa	4,790	37,800	25	35	53.8
Farley 1(O), Dothan, Ala.	15,100	19,600	30	40	52.2
Farley 2(O), Dothan, Ala.					39.1
Fermi 2(C), Lagoona Beach, Mich.	8,150	349,000	15	70	134.0
Fitzpatrick 1(O), Scriba, N.Y.	1,320	28,800	12.5	40	103.0
Fort Calhoun 1(O), Washington, Neb.	8,980	129,000	25	35	61.5
Fort Saint Vrain 1(O), Fort St. Vrain, Colo.	17,200	32,800	17.5	45	38.8
Galloway 1(C), Galloway, Mo.	11,300	31,200	17.5	35	110.0
Ginna 1(O), Ontario, N.Y.	3,480	98,900	12.5	40	63.0
Grand Gulf 1(O), Vicksburg, Miss.	3,890	6,230	20	40	83.0
Grand Gulf 2(C), Vicksburg, Miss.					78.7
Haddam Neck 1(O), Haddam Neck, Conn.	48,600	144,000	17.5	50	74.1
Hatch 1(O), Baxley, Ga.	972	8,280	20	70	51.0
Hatch 2(O), Baxley, Ga.					56.0
Indian Point 1(O), Buchanan, N.Y.	58,600	227,000	17.5	50	274.0
Indian Point 2(O), Buchanan, N.Y.					214.0
Kewaunee 1(O), Carlton, Wis.	2,190	33,200	12.5	40	46.9
Lacrosse 1(O), Omaha, Ill.	34,900	13,900	15	60	118.0
Lacrosse 2(C), Omaha, Ill.					120.0
La Crosse 1(O), La Crosse, Wis.	3,090	14,600	15	35	16.0
Limerick 1(C), Montgomery, Pa.	27,700	216,000	20	55	211.0
Limerick 2(C), Montgomery, Pa.					197.0
Maine Yankee 1(O), Wiscasset, Maine	11,600	19,400	15	35	78.5
Marble Hill 1(C), Jefferson, Ind.	12,300	138,000	15	60	87.2
Marble Hill 2(C), Jefferson, Ind.					83.8
McGuire 1(O), Cornelius, N.C.	11,600	19,400	15	35	104.0
McGuire 2(C), Cornelius, N.C.					110.0
Midland 1(C), Midland, Mich.	18,300	34,200	12.5	40	54.1
Midland 2(C), Midland, Mich.					60.6
Millstone 1(O), Waterford, Conn.	33,000	28,800	20	65	91.5
Millstone 2(O), Waterford, Conn.					135.0
Millstone 3(C), Waterford, Conn.					174.0
Monticello 1(O), Monticello, Minn.	1,310	30,900	15	35	44.6
Nine Mile Point 1(O), Scriba, N.Y.	1,320	28,800	12.5	40	66.2
Nine Mile Point 2(C), Scriba, N.Y.					134.0
North Anna 1(O), Mineral, Va.	2,290	9,320	20	35	66.0
North Anna 2(O), Mineral, Va.					60.3
Oconee 1(O), Seneca, S.C.	3,630	76,400	20	30	56.8
Oconee 2(O), Seneca, S.C.					58.3
Oconee 3(O), Seneca, S.C.					58.3

PLANT/LOCATION	PEAK EARLY DEATHS*	PEAK EARLY INJURIES*	PEAK LATENT RADIUS IN MILES*	PEAK INJURY RADIUS IN MILES*	SCALED FINANCIAL CONSEQUENCES IN BILLIONS
Oyster Creek 1(O), Toms River, N.J.	24,300	24,700	17.5	50	79.8
Palisades 1(O), South Haven, Mich.	1,700	13,000			52.6
Palo Verde 1(C), Maricopa, Ariz.	3,290	26,500	20	30	89.7
Palo Verde 2(C), Maricopa, Ariz.					84.1
Palo Verde 3(C), Maricopa, Ariz.					79.5
Peach Bottom 2(O), Peach Bottom, Pa.	24,500	50,900	20	35	119.0
Peach Bottom 3(O), Peach Bottom, Pa.					119.0
Perry 1(C), Painesville, Ohio	4,960	184,030	15	70	102.0
Perry 2(C), Painesville, Ohio					86.87
Pilgrim 1(O), Plymouth, Mass.	3,170	72,500	20	65	81.8
Point Beach 1(O), Two Creeks, Wis.	1,290	29,000	12.5	40	41.6
Point Beach 2(O), Two Creeks, Wis.					42.8
Prairie Island 1(O), Red Wing, Minn.	2,7900	12,400	15	35	48.3
Prairie Island 2(O), Red Wing, Minn.					49.5
Quad Cities 1(O), Cordova, Ill.	18,800	76,400	15	60	65.1
Quad Cities 2(O), Cordova, Ill.					65.1
Rancho Seco 1(O), Clay Station, Calif.	35,700	30,400	20	45	111.0
Robinson 2(O), Hartsville, S.C.	3,400	19,600	20	30	42.3
St. Lucie 1(O), Ft. Pierce, Fla.	7,310	12,600	20	70	54.3
St. Lucie 2(C), Ft. Pierce, Fla.					39.1
Salem 1(O), Salem, N.J.	182,800	75,700	20	35	135.0
Salem 2(O), Salem, N.J.					150.0
San Onofre 1(O), San Clemente, Calif.	27,800	24,300	17.5	35	58.0
San Onofre 2(O), San Clemente, Calif.					186.0
San Onofre 3(O), San Clemente, Calif.					182.0
Seabrook 1(C), Seabrook, N.H.	6,580	24,800	20	65	163.0
Seabrook 2(C), Seabrook, N.H.					150.0
Sequoyah 1(O), Daisy, Tenn.	29,500	68,600	30	30	96.8
Sequoyah 2(O), Daisy, Tenn.					98.6
Shearon Harris 1(C), Apex, N.C.	13,400	46,300	20	30	68.3
Shearon Harris 2(C), Apex, N.C.					67.8
Sheraham 1(C), Wading River, N.Y.	52,600	130,000	17.5	30	117.0
South Texas 1(C), South Texas, Tex.	11,300	8,770	25	35	112.0
South Texas 2(C), South Texas, Tex.					104.0
Summer 1(O), Fairfield, S.C.	6,280	110,000	20	30	66.1
Surry 1(O), Grand Neck, Va.	42,900	89,300	20	55	56.3
Surry 2(O), Grand Neck, Va.					57.8
Susquehanna 1(O), Berwick, Pa.	28,600	53,900	50	55	143.0
Susquehanna 2(C), Berwick, Pa.					137.0
Three Mile Island 1(O), Middletown, Pa.	36,100	98,800	20	55	107.0
Three Mile Island 2(O), Middletown, Pa.					122.0
Trojan 1(O), Prescott, Ore.	1,130	14,300	12.5	30	89.7
Turkey Point 3(O), Florida City, Fla.	48,500	186,000	20	70	47.5
Turkey Point 4(O), Florida City, Fla.					48.6
Vermont Yankee 1(O), Vernon, Vt.	19,300	11,160	15	35	66.8
Vogtle 1(C), Burke, Ga.	361	48,800	30	70	78.3
Vogtle 2(C), Burke, Ga.					87.2
Waterford 3(C), St. Charles, La.	48,400	353,000	20	60	131.0
Watts Bar 1(C), Rhea, Tenn.	5,348	18,380	20	30	86.6
Watts Bar 2(C), Rhea, Tenn.					81.3
Wpps 1(C), Richland, Wash.	216	17,000	17.5	30	88.4
Wpps 2(C), Benton, Wash.	300	14,700	17.5	30	77.3
Wpps 3(C), Olympia, Wash.	173	12,800	17.5	30	73.7
Wolf Creek 1(C), Burlington, Kan.	8,100	3,130	25	35	103.0
Yankee Rowe 1(O), Rowe, Mass.	11,200	16,800	17.5	30	31.4
Zimmer 1(C), Moscow, Ohio	12,300	194,000	20	30	54.1
Zion 1(O), Zion, Ill.	24,300	181,000	15	70	144.0
Zion 2(O), Zion, Ill.					144.0

(O) INDICATES THE PLANT IS COMPLETE (C) INDICATES THE PLANT IS UNDER CONSTRUCTION

All figures taken from CRAC2 computer run exercise performed by Sandia National Laboratories under contract to the U.S. Nuclear Regulatory Commission. All consequence figures except cost are based on an 1130-megawatt reactor, the occurrence of a "Group 1" release, and "summary evacuation." Cost figures are scaled according to reactor size. "Peak" values are the maximum calculated consequences for early deaths, early injuries, cancer deaths, total radius, and injury radius.

*Early deaths are deaths that occur within one year of exposure. *Early injuries are radiation-related injuries which appear within a year of exposure and which require medical attention.

*The peak fatal radius and peak injury radius are the maximum distances from the plant at which early deaths and early injuries are projected to occur.

*Scaled costs are in 1980 dollars. Several classes of accident-related costs are not included in these estimates, such as nonrelocation costs, health care costs, and "weakened costs" (e.g., shutdown of adjacent reactors, loss of industrial capacity and jobs, etc.).

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ENCLOSURE 6