To: Collins, NRR
G20020142

March 22, 2002

cys: EDO
DEDMRS
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AO
OGC
Goldberg, OGC
Subbarathnam, NRR

Dr. William D. Travers
Executive Director for Operations
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: SECOND AMENDMENT TO PETITION PURSUANT TO 10 CFR 2.206 REGARDING SAFETY AT OPERATING NUCLEAR POWER PLANTS

Dear Dr. Travers:

On March 11, 2002, UCS submitted a 2.206 petition to the NRC seeking to increase safety at operating nuclear power plants. UCS indicated that the petition would be circulated to organizations who might be interested in joining as co-petitioners. The petition was amended on March 21, 2002, to include sixteen organizations that signed on to the petition. The petition is amended to include one additional person. The petitioners now include the following organizations and individuals (listed alphabetically by organization):

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David Lochbaum, Nuclear Safety Engineer
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David Lochbaum of UCS will function as point-of-contact between the petitioners and the NRC regarding this petition. The petitioners request that the NRC add all of the petitioners to the service list for correspondence regarding this petition.

Request for Enforcement-Related Action

Pursuant to 10 CFR 2.206, the petitioners request the Nuclear Regulatory Commission to immediately issue orders to the owners of all operating nuclear power plants to take measures that will reduce the risk from sabotage of irradiated fuel. Specifically, those measures are:

1. Impose a 72-hour limit for operation when the number of operable onsite alternating current power sources (i.e., emergency diesel generators) is one less than the number in the Technical Specification limiting condition for operation. This 72-hour limit would be applicable when the nuclear plant is in any mode of operation other than hot shutdown, cold shutdown, refueling, or defueled.

2. Impose a minimum 24-hour time-to-boil for the spent fuel pool water. This limit would be applicable at all times.

The licensees covered by this petition are listed in Attachment 1. The petitioners realize that a few of the operating reactors listed on Attachment 1 may already have Technical Specifications containing the 72-hour limiting condition for operation on inoperable emergency diesel generators. The orders issued by the NRC to the owners of those reactors need only address the second measure specified above. Additionally, the Oconee nuclear plant does not rely on emergency diesel generators as do the other plants. For this special case, the petitioners request that the NRC modify the first measure to provide equivalent protection for its emergency power supply.

The petitioners realize these two measures may not be needed permanently. The end of the American war on terrorism would signal an opportunity to reconsider the ongoing need for these measures. If and when the NRC ever reinstates meetings on nuclear plant physical protection that allow public stakeholders to participate, a forum would exist to discuss the timing for withdrawing or revising these measures. The petitioners request these measures not be withdrawn or revised absent that public forum.

Facts that Constitute Bases for Requested Action

Measure No. 1:
In 1967, the NRC adopted Appendix A to 10 CFR Part 50.[1] Appendix A contains General Design Criteria for nuclear power plant design, construction, operation, and maintenance. General Design Criterion (GDC) 17 applies to the electric power systems for nuclear power plants.

In 1974, the NRC formally issued a regulatory position describing how owners could conform with the requirements of GDC 17.[2] This regulatory position defined the limiting condition for operation (LCO) for available alternating current (a.c.) power sources when the reactor is operating as two physically independent circuits from the offsite transmission network and redundant onsite alternating current power supplies. The NRC's position was articulated as:

> *"If the available a.c. power sources are one less than the LCO, power operation may continue for a period that should not exceed 72 hours if the system stability and reserves are such that a subsequent single failure (including trip of the unit's generator, but excluding an unrelated failure of the remaining offsite circuit if this degraded state was caused by the loss of an offsite source) would not cause total loss of offsite power."*

Based on this NRC regulatory position, the technical specifications for most, if not all, nuclear power plants originally contained a limiting condition for operation that allowed one of the required emergency diesel generators to be out of service for up to 72 hours when the reactor was operating. If the emergency diesel generator could not be returned to service within 72 hours, the reactor had to shut down. Many owners have subsequently received permission from the NRC to extend the limiting condition for operation period from 72 hours to as long as 14 days. For example, earlier this year the NRC approved a request by the owner of Millstone Unit 2 to relax the LCO to 14 days.[3] Other owners are currently seeking similar relaxations.[4]

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[1] Atomic Energy Commission Press Release No. K-172, "AEC Publishes General Design Criteria for Nuclear Power Plant Construction Permits," July 10, 1967.

[2] Atomic Energy Commission, Regulatory Guide 1.93, "Availability of Electric Power Sources," December 1974.

[3] John T. Harrison, Project Manager, Nuclear Regulatory Commission, to J. A. Price, Vice President – Nuclear Technical Services – Millstone, Dominion Nuclear Connecticut, Inc., "Millstone Nuclear Power Station, Unit No. 2 – Issuance of Amendment Re: Emergency Diesel Generator Allowed Outage Time (TAC No. MB2196)," January 4, 2002.

[4] William A. Eaton, Vice President – Operations, Entergy Operations, Inc., to Nuclear Regulatory Commission,

In 1988, the NRC required owners to evaluate their nuclear plants for severe accident vulnerabilities. The owners conducted individual plant examinations (IPEs). The IPEs evaluated the risk of reactor core damage from a variety of credible initiating events. The NRC compiled IPE information from owners and documented the results in a formal report[5] and an accompanying Access database.

Among the credible initiating events that could lead to reactor core damage at a nuclear power plant was station blackout (SBO). Station blackout is the loss of alternating current (a.c.) power to safety equipment. Safety equipment can get a.c. power from the electrical grid (normal source) or from onsite emergency diesel generators (backup source). If the electrical grid fails or the plant's connections to the electrical grid are disabled, the emergency diesel generators must function to prevent a station blackout event. If the emergency diesel generators fail, the plant enters a station blackout event where the only power available is direct current (d.c) from onsite batteries. If these batteries are depleted before a.c. power from either the electrical grid or the emergency diesel generators is restored, reactor core damage from overheating can occur with associated harm to the public from the radioactivity released.

The NRC recognized the risks posed by station blackout events. The NRC added a rule (10 CFR 50.63) in 1988 requiring nuclear plants to be capable of coping with the loss of a.c. power from the electrical grid and from emergency diesel generators for a short duration, typically four hours. Attachment 2 provides the reactor core damage risk from station blackout for the nuclear power plants operating in the United States. The data show that the station blackout risk can be high. At the FitzPatrick nuclear plant in New York, the risk from station blackout is ten times the risk from all other events combined![6]

Last year, the NRC issued a report on the safety benefits realized from the station blackout rule. The NRC reaffirmed the relevance of SBO from a public health perspective:

> "SBO can be a significant contributor to core damage frequency (CDF) and, with the consideration of containment failure, can be an important contributor to reactor risk."[7]

The NRC report explicitly quantified the role played by emergency diesel generators in reducing the station blackout risk. For example, several owners installed additional emergency diesel generators to reduce their plants' vulnerabilities:[8]

- Adding emergency diesel generators, the core damage risk at the Arkansas Nuclear One Unit 2 reactor was reduced by 43 to 47 percent.

- Adding emergency diesel generators reduced the core damage risk at the Calvert Cliffs nuclear power by 24 percent.

"Grand Gulf Nuclear Station / License Amendment Request / Emergency Diesel Generator Extended Allowed Out-of-Service Time (AOT) – TS 3.8.1, 'AC Source – Operating,' LDC 2001-192," January 31, 2002.

[5] Nuclear Regulatory Commission, NUREG-1560, "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance," October 1996.

[6] The petitioners acknowledge the information in Attachment 2 is dated, coming from risk studies performed nearly ten years ago. But it is the most complete data set publicly available and must be used until the NRC makes more contemporary data available. This data were used by the NRC staff in the recent SBO effectiveness report.

[7] William S. Raughley, Office of Nuclear Regulatory Research, Nuclear Regulatory Commission, "Final Report: Regulatory Effectiveness of the Station Blackout Rule," pg. 1, 2001. (ADAMS Accession No. ML003741781)

[8] William S. Raughley, Office of Nuclear Regulatory Research, Nuclear Regulatory Commission, "Final Report: Regulatory Effectiveness of the Station Blackout Rule," pg. 7, 2001. (ADAMS Accession No. ML003741781)

- Adding emergency diesel generators reduced the core damage risk at the Turkey Point nuclear plant by 20 percent.

- Adding a single emergency diesel generator reduced the core damage risk at the Diablo Canyon nuclear plant by 14 to 18 percent.

Not surprisingly, the NRC report also concluded that removing emergency diesel generators increased the risk from station blackout events:

> "INEEL [Idaho National Engineering and Environmental Laboratory] studies indicate that the plants that committed to a 0.975 minimum individual EDG [emergency diesel generator] target reliability are having difficulty achieving a 0.975 unit average EDG target reliability. With MOOS [maintenance out of service] while the reactor unit is at power, the INEL-95/0035 DRAFT update indicates that only 8 of the 44 operating plants that committed to a 0.975 minimum EDG reliability achieved a unit average EDG reliability above 0.975."
>
> and
>
> "Table 4 illustrates that a 0.025 decrease in EDG reliability could increase the SBO CDF [core damage frequency] by 1.0E-05 per RY [reactor year] or more in plants in the offsite power clusters 2-5 (about 60 plants)."
>
> and
>
> "Increases in the SBO CDF of 1.0E-05 per RY or more erode the 3.2E-05 per RY risk reduction obtained from implementing the SBO rule."[9]

Hence, the NRC report on station blackout documented that risk decreased when emergency diesel generators were added and that risk increased when emergency diesel generators were removed. The measure sought by the petitioners would have the effect of adding emergency diesel generators by preventing the removal of emergency diesel generators for long periods of maintenance. Therefore, the measure sought by the petitioners clearly and unequivocally reduces risk.

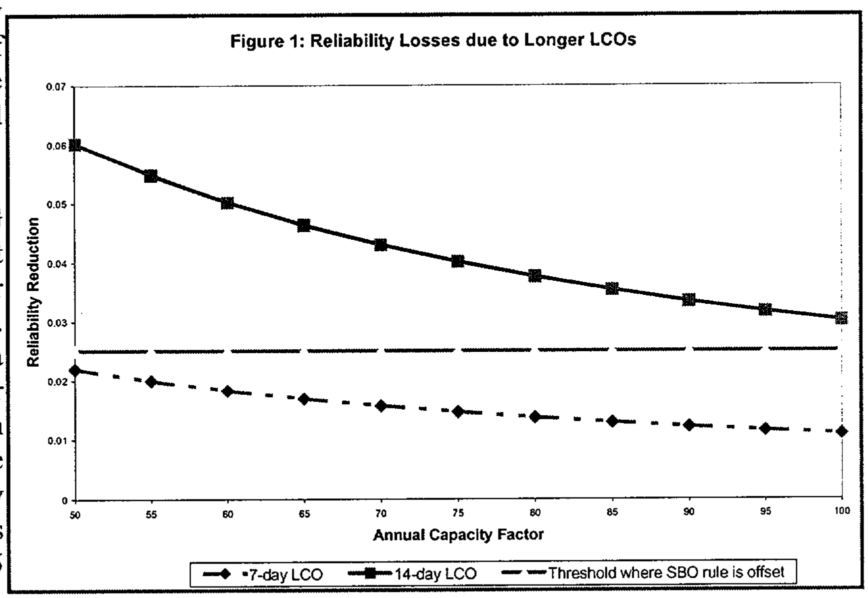

Figure 1 illustrates the EDG reliability reduction that can result from lengthening the original 72-hour LCO duration to 7-days and 14-days. The EDG reliability reduction is a function of the plant's capacity factor because the LCO only applies when the plant is running. Thus, the same LCO period causes a larger reliability reduction when a plant only operates half the year as when a plant runs 75 percent of the year.

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9 William S. Raughley, Office of Nuclear Regulatory Research, Nuclear Regulatory Commission, "Final Report: Regulatory Effectiveness of the Station Blackout Rule," pp. 10-11, 2001. (ADAMS Accession No. ML003741781)

The reliability reduction for a 14-day LCO duration at a nuclear plant with a 90 percent capacity factor was calculated as follows:

> EDG required hours = 90 percent * 365.25 days * 24 hours/day
> EDG required hours = 7,889.4
>
> EDG available hours, 72-hour LCO = 7,889.4 – 72 = 7,817.4
>
> EDG available hours, 14-day LCO = 7,889.4 – (14 *24) = 7,553.4
>
> EDG reliability reduction = (7,817.4 – 7553.4) / 7,889.4
> EDG reliability reduction = 0.0335

The horizontal line on Figure 1 at a risk reduction of 0.025 represents the threshold established by the NRC in its station blackout report where the safety benefits of the SBO rule are negated. Thus, the measure sought by UCS would have greater safety returns than the SBO rule at plants with a 14-day LCO duration for emergency diesel generators. The NRC imposed the SBO rule based on its safety gains. The NRC has to order the measure sought by UCS since it affords even larger safety benefits.

The NRC recently proposed adding the electrical switchyard—the connection between the nuclear plant and the electrical grid—to the scope of the license renewal rule. The NRC justified this incorporation, in part, on the following fact:

> *"...the [NRC] staff found that offsite power is more likely to be restored (0.6 hours median time to restore) than the emergency diesel generators (8 hours median time to repair) ending an SBO event."*[10]

The attacks of September 11th demonstrated that terrorists are capable of carrying out coordinated attacks on American soil. The transmission lines and substations constituting the electrical grid are virtually unprotected targets for terrorists. Terrorists would not have to penetrate security fences or overpower armed guards to blow up transmission towers. Likewise, the switchyard at the typical nuclear power plants is outside the security perimeter fences and a relatively softer target than the nuclear plant itself. Thus, there is no reason to consider the normal supply of a.c. power to nuclear power plants resistant to or immune from terrorist attack.

If terrorists successfully attack the transmission lines and/or the switchyard for any operating nuclear power plant, the emergency diesel generators must function to prevent a station blackout event. The emergency diesel generators are located behind security fences where they are protected by armed security guards. It would be harder, though not impossible, for the terrorists to also successfully attack the emergency diesel generators. But it may not be necessary for the terrorists to even try destroying the emergency diesel generators since they may already be non-functional. Obviously, the longer that emergency diesel generators are out of service increases the likelihood that a successful terrorist attack against the electrical grid cascades to a station blackout and reactor core damage.

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[10] Christopher I. Grimes, Program Director, Nuclear Regulatory Commission, to Alan Nelson, Nuclear Energy Institute, and David Lochbaum, Union of Concerned Scientists, "Proposed Staff Guidance on Scoping of Equipment Relied on to Meet the Requirements of the Station Blackout (SBO) Rule (10 CFR 50.63) for License Renewal (10 CFR 50.4(a)(3))," March 1, 2002.

Little can be done quickly to provide better protection of the electrical grid. But it is possible to swiftly re-impose the 72-hour limiting condition for operation on emergency diesel generators. The data in the NRC report issued last year on the SBO rule clearly and convincingly show that improved emergency diesel generator reliability has a direct and positive impact on reducing station blackout risk. This measure sought by the petitioners would make it more likely that the emergency diesel generators will be available to provide power to safety equipment in the event that terrorists successfully attack the electrical grid. This measure reduces the risk of station blackout and reactor core damage.

Measure No. 2:
The second measure requested by the petitioners seeks to reduce the risk of damage to irradiated fuel in the spent fuel pool. Nuclear power plants shut down periodically to discharge one-quarter to one-third of the fuel in the reactor core to the spent fuel pool and replace it with fresh fuel. The discharged fuel is thermally and radioactively hot. Forced circulation cooling of the water in the spent fuel pools is necessary to remove that heat. If forced circulation cooling is lost, the water will begin to heat up. Left unchecked, the water will boil. If the evaporative losses are uncompensated, the water level in the spent fuel pool will drop to the point where the irradiated fuel is exposed, overheated, and damaged.

A key parameter in the safety of irradiated fuel in the spent fuel pool is time-to-boil, or the length of time it takes for the water in the spent fuel pool to begin boiling after forced circulation cooling stops. The time-to-boil is a function of many variables including inventory of irradiated fuel, time period since removal from the reactor core, and volume of the spent fuel pool. The primary factor determining the time-to-boil is the number of freshly discharged irradiated fuel in the spent fuel pool. When many irradiated fuel assemblies are discharged to the spent fuel pool shortly after reactor shutdown, the time-to-boil can be reduced to less than 24 hours. For example, in spring of 2000 the owner of Indian Point Unit 3 discharged enough irradiated fuel assemblies to the spent fuel pool to reduce the time-to-boil to about 8 hours.

Terrorist actions outside a nuclear power plant's security fences can interrupt the forced circulation cooling of the spent fuel pool water. Without providing explicit sabotage blueprints, terrorists could successfully attack the offsite power transmission lines and/or the water intake system for cooling water and cause spent fuel pool cooling to be stopped. Restricting the time-to-boil to a minimum of 24 hours reduces the likelihood that any such terrorist actions result in damage to the irradiated fuel in the spent fuel pool and release of radioactivity to the environment. The longer that plant workers have to respond to a loss of spent fuel pool cooling, the more likely they will be successful in restoring the normal cooling system or providing a backup system.

Lack of Other NRC Proceeding Available
The NRC recently issued orders to the owners of all operating nuclear power plants requiring them to take security measures. The specific security measures were not made publicly available. The petitioners, along with the rest of the public, was barred from the process undertaken by the NRC and plant owners to develop the particulars in the recently issued orders. There is no evidence that the public will be readmitted into the regulatory process anytime soon. Thus, this petition was the only process available to the petitioners to remedy this safety problem at all the affected plants.

Related Issues
Obviously, the increased safety from re-imposing the 72-hour limiting condition for operation on emergency diesel generators is negated when the NRC issues Notices of Enforcement Discretion (NOEDs) allowing owners to ignore the limiting condition for operation. The NRC should cease and desist issuing NOEDs that allow nuclear reactors to operate for longer periods of time with broken emergency diesel generators.

Lastly, the NRC's procedures governing 2.206 petitions call for you to assign the petition to an office director for processing. The nature of this petition would normally dictate its assignment to the Director of the Office of Nuclear Reactor Regulation (NRR). As you must be aware, the NRC's Office of the Inspector General has an ongoing investigation into the Director of NRR's role in the NRC Chairman providing one of the petitioners (UCS) with inaccurate information. Pending the completion of this investigation, the petitioners feel it would be more appropriate for someone other than the Director of NRR to be responsible for our petition. The Deputy Executive Director for Reactor Programs or the Deputy Director of NRR would be acceptable.

Sincerely on behalf of the petitioners,

David A. Lochbaum
Nuclear Safety Engineer
Union of Concerned Scientists

Attachments:
1) Operating Nuclear Power Plants
2) Station Blackout Risks

Attachment 1: Operating Nuclear Power Plants

STATE	PLANT NAME	CITY	DOCKET
AL			
	Browns Ferry 2	Decatur	50-260
	Browns Ferry 3	Decatur	50-296
	Joseph M. Farley 1	Dothan	50-348
	Joseph M. Farley 2	Dothan	50-364
AR			
	Arkansas Nuclear One 1	Russellville	50-313
	Arkansas Nuclear One 2	Russellville	50-368
AZ			
	Palo Verde 1	Wintersburg	50-528
	Palo Verde 2	Wintersburg	50-529
	Palo Verde 3	Wintersburg	50-530
CA			
	Diablo Canyon 1	Avila Beach	50-275
	Diablo Canyon 2	Avila Beach	50-323
	San Onofre 2	San Clemente	50-361
	San Onofre 3	San Clemente	50-362
CT			
	Millstone 2	Waterford	50-336
	Millstone 3	Waterford	50-423
FL			
	Crystal River 3	Red Level	50-302
	St. Lucie 1	Hutchinson Island	50-335
	St. Lucie 2	Hutchinson Island	50-389
	Turkey Point 3	Florida City	50-250
	Turkey Point 4	Florida City	50-251
GA			
	Alvin W. Vogtle 1	Waynesboro	50-424
	Alvin W. Vogtle 2	Waynesboro	50-425
	Edwin I. Hatch 1	Baxley	50-321
	Edwin I. Hatch 2	Baxley	50-366
IA			
	Duane Arnold	Palo	50-331
IL			
	Braidwood 1	Braidwood	50-456
	Braidwood 2	Braidwood	50-457

STATE	PLANT NAME	CITY	DOCKET
	Byron 1	Rockford	50-454
	Byron 2	Rockford	50-455
	Clinton	Clinton	50-461
	Dresden 2	Morris	50-237
	Dresden 3	Morris	50-249
	LaSalle County 1	Seneca	50-373
	LaSalle County 2	Seneca	50-374
	Quad Cities 1	Cordova	50-254
	Quad Cities 2	Cordova	50-265
KS			
	Wolf Creek	Burlington	50-482
LA			
	River Bend	St. Francisville	50-458
	Waterford 3	Taft	50-382
MA			
	Pilgrim	Plymouth	50-293
MD			
	Calvert Cliffs 1	Lusby	50-317
	Calvert Cliffs 2	Lusby	50-318
MI			
	Donald C. Cook 1	Bridgman	50-315
	Donald C. Cook 2	Bridgman	50-316
	Fermi 2	Newport	50-341
	Palisades	South Haven	50-255
MN			
	Monticello	Monticello	50-263
	Prairie Island 1	Red Wing	50-282
	Prairie Island 2	Red Wing	50-306
MO			
	Callaway	Fulton	50-483
MS			
	Grand Gulf	Port Gibson	50-416
NC			
	Brunswick 1	Southport	50-325
	Brunswick 2	Southport	50-324
	McGuire 1	Cornelius	50-369
	McGuire 2	Cornelius	50-370
	Shearon Harris	New Hill	50-400
NE			
	Cooper	Brownville	50-298

STATE	PLANT NAME	CITY	DOCKET
	Fort Calhoun	Fort Calhoun	50-285
NH			
	Seabrook	Seabrook	50-443
NJ			
	Hope Creek	Salem	50-354
	Oyster Creek	Forked River	50-219
	Salem 1	Salem	50-272
	Salem 2	Salem	50-311
NY			
	Indian Point 2	Buchanan	50-247
	Indian Point 3	Buchanan	50-286
	James A. FitzPatrick	Scriba	50-333
	Nine Mile Point 1	Scriba	50-220
	Nine Mile Point 2	Scriba	50-410
	R. E. Ginna	Ontario	50-244
OH			
	Davis-Besse	Oak Harbor	50-346
	Perry	North Perry	50-440
PA			
	Beaver Valley 1	Shippingport	50-334
	Beaver Valley 2	Shippingport	50-412
	Limerick 1	Pottstown	50-352
	Limerick 2	Pottstown	50-353
	Peach Bottom 2	Delta	50-277
	Peach Bottom 3	Delta	50-278
	Susquehanna 1	Berwick	50-387
	Susquehanna 2	Berwick	50-388
	Three Mile Island 1	Londonderry Township	50-289
SC			
	Catawba 1	Clover	50-413
	Catawba 2	Clover	50-414
	H. B. Robinson 2	Hartsville	50-261
	Oconee 1	Seneca	50-269
	Oconee 2	Seneca	50-270
	Oconee 3	Seneca	50-287
	Virgil C. Summer	Parr	50-395
TN			
	Sequoyah 1	Soddy-Daisy	50-327
	Sequoyah 2	Soddy-Daisy	50-328
	Watts Bar 1	Spring City	50-390

STATE	PLANT NAME	CITY	DOCKET
TX			
	Comanche Peak 1	Glen Rose	50-445
	Comanche Peak 2	Glen Rose	50-446
	South Texas Project 1	Palacios	50-498
	South Texas Project 2	Palacios	50-499
VA			
	North Anna 1	Mineral	50-338
	North Anna 2	Mineral	50-339
	Surry 1	Gravel Neck	50-280
	Surry 2	Gravel Neck	50-281
VT			
	Vermont Yankee	Vernon	50-271
WA			
	Columbia Generating Station	Richland	50-397
WI			
	Kewaunee	Carlton	50-305
	Point Beach 1	Two Rivers	50-266
	Point Beach 2	Two Rivers	50-301

Attachment 2: Station Blackout Risks

PLANT NAME	CORE DAMAGE RISK FROM STATION BLACKOUT
FITZPATRICK	91.1%
RIVER BEND	87.1%
LA SALLE 1&2	80.6%
HOPE CREEK	73.0%
BRUNSWICK 1&2	66.7%
NINE MILE POINT 1	63.6%
COLUMBIA GENERATING STATION	61.1%
VOGTLE 1&2	60.6%
OYSTER CREEK	59.0%
QUAD CITIES 1&2	47.7%
MONTICELLO	46.2%
WOLF CREEK	44.8%
GRAND GULF 1	43.4%
SALEM 1	40.4%
KEWAUNEE	39.7%
CLINTON	36.8%
SOUTH TEXAS PROJECT 1&2	34.9%
COOPER	34.8%
WATERFORD 3	34.7%
ARKANSAS NUCLEAR ONE 1	33.8%
SALEM 2	30.9%
CALLAWAY	30.8%
BEAVER VALLEY 1	30.4%
BROWNS FERRY 2	27.1%
COMANCHE PEAK 1&2	26.2%
BEAVER VALLEY 2	25.3%
SUMMER	24.5%
SHEARON HARRIS 1	24.4%
DUANE ARNOLD	24.2%
MCGUIRE 1&2	23.3%
BRAIDWOOD 1&2	22.6%

PLANT NAME	CORE DAMAGE RISK FROM STATION BLACKOUT
WATTS BAR 1&2	21.6%
CRYSTAL RIVER 3	21.5%
SEABROOK	21.2%
PALO VERDE 1,2,&3	21.2%
PALISADES	17.9%
NINE MILE POINT 2	17.7%
PERRY 1	17.3%
HATCH 1	14.8%
INDIAN POINT 2	14.3%
VERMONT YANKEE	14.0%
BYRON 1&2	13.9%
HATCH 2	13.7%
POINT BEACH 1&2	13.1%
ST. LUCIE 1	11.5%
OCONEE 1,2,&3	11.2%
NORTH ANNA 1&2	11.2%
ZION 1&2	11.0%
INDIAN POINT 3	10.9%
ST. LUCIE 2	10.1%
FARLEY 1&2	9.4%
MILLSTONE 3	9.1%
PEACH BOTTOM 2&3	8.7%
H.B. ROBINSON 2	8.1%
SAN ONOFRE 2&3	6.7%
SURRY 1&2	6.5%
PRAIRIE ISLAND 1&2	6.1%
DIABLO CANYON 1&2	5.7%
DRESDEN 2&3	5.0%
ARKANSAS NUCLEAR ONE 2	3.6%
TMI 1	3.5%
SEQUOYAH 1&2	3.1%
LIMERICK 1&2	2.3%
FERMI 2	2.3%

PLANT NAME	CORE DAMAGE RISK FROM STATION BLACKOUT
D.C. COOK 1&2	1.8%
TURKEY POINT 3&4	1.3%
GINNA	1.1%
CATAWBA 1&2	1.0%
PILGRIM 1	0.0%
MILLSTONE 2	0.0%
DAVIS-BESSE	
FORT CALHOUN 1	
CALVERT CLIFFS 1&2	