



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

February 16, 2012

Mr. R.W. Borchardt  
Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT:** DRAFT FINAL REVISION 1 TO REGULATORY GUIDE 1.93, "AVAILABILITY OF ELECTRIC POWER SOURCES"

Dear Mr. Borchardt:

During the 591<sup>st</sup> meeting of the Advisory Committee on Reactor Safeguards, February 9-11, 2012, we reviewed draft final Revision 1 to Regulatory Guide (RG) 1.93, "Availability of Electric Power Sources." Our Regulatory Policies and Practices Subcommittee also reviewed this matter during a meeting on September 7, 2011. During these meetings we had the benefit of discussions with representatives of the NRC staff. We also had the benefit of the documents referenced.

### **RECOMMENDATION**

Draft final Revision 1 to Regulatory Guide 1.93, "Availability of Electric Power Sources," should be issued as final.

### **BACKGROUND**

The staff has an ongoing program to review and update regulatory guides (RGs). During these reviews, the staff incorporates applicable portions of new or revised consensus codes and standards and new research findings to the extent that this information is applicable to assuring adequate implementation of the regulations. Proposed Revision 1 to RG 1.93 was issued for public comment on September 24, 2010. Public comments have been received, analyzed, and dispositioned by the staff.

### **DISCUSSION**

The revision to RG 1.93 was influenced by a number of developments since it was originally issued in 1974, including lessons learned from the Northeast Blackout of 2003 and the impact of deregulation on the availability of offsite power at adequate voltage and capacity.

In the Northeast Blackout, nine nuclear power plants tripped and lost offsite power. The prolonged recovery times raised new concerns about grid stability and the scheduling of maintenance on onsite power sources. Generic Letter 2006-02 was issued to share these concerns with the industry.

As a result of deregulation, additional guidance was included in this RG on the need for nuclear power plant operators to maintain communication with the transmission system operator. This will assist in the scheduling of maintenance of onsite power sources and help ensure the availability of offsite power at adequate voltage and capacity following a plant trip to maintain stable plant electrical conditions. NRC worked with the Federal Energy Regulatory Commission (FERC) on issuance of a FERC rule making to accomplish this. As a result, the North American Electric Reliability Corporation (NERC) procedure NUC-001-2, which requires coordination between nuclear power plant operators and transmission system operators, was issued on January 21, 2010.

Draft final Revision 1 to RG 1.93 does not apply to evolutionary or passive plants. Evolutionary plant designs have 3-4 safety trains and excess redundancy in their onsite power systems. Passive plants can avoid core damage for 72 hours without AC power. Passive plants and evolutionary plants will be evaluated on a case-by-case basis.

The intent of the regulatory positions in draft final Revision 1 to RG 1.93, is to ensure that a nuclear power plant is in an acceptably safe operating mode whenever the available electric power sources are less than the technical specification Limiting Condition for Operation (LCO). The RG discusses the various levels of degradation of the electric power system, in order of increasing degradation. The technical specifications specify the required actions and the required action completion time for each degraded level. Whenever the technical specifications allow unrestricted operation to resume, such resumption should be contingent on verification of the capability of the restored sources.

For each of the seven levels of degradation of the electric power system, draft final Revision 1 to RG 1.93 places numerical time limits on continued operation. According to the staff, these time limits were derived from deterministic evaluations that took into consideration the approximate time to perform the associated corrective maintenance. For the six original levels, these time limits remain the same. A level was added to describe the loss of one inverter less than the LCO.

There may be situations where continued power operation may be preferable to shutdown, for example, to provide time to bring in alternate power supplies, time to stabilize the grid, or time to enhance decay heat removal capability. There are several regulatory mechanisms that can be used to obtain a time extension under these circumstances.

We concur with the staff that the draft final Revision 1 to RG 1.93 properly addresses these issues and should be issued.

Sincerely,

*/RA/*

J. Sam Armijo  
Chairman

## REFERENCES

1. Regulatory Guide 1.93, "Availability of Electric Power Structures," December 1974 (ML003740292)
2. Draft Final Regulatory Guide 1.93, Revision 1, "Availability of Electric Power Structures," January 2012 (ML090550661)
3. GL 2006-02, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," February 1, 2006 ( ML070950409)
4. The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, "Recommendations for Enhancing Reactor Safety in the 21<sup>st</sup> Century," July 12, 2011 (ML11861807)

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1. Regulatory Guide 1.93, "Availability of Electric Power Structures," December 1974 (ML003740292)
2. Draft Final Regulatory Guide 1.93, Revision 1, "Availability of Electric Power Structures," January 2012 (ML090550661)
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Accession No: **ML12046A869**

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Letter to R.W. Borchardt, EDO, from J. Sam Armijo, ACRS Chairman, dated February 16, 2012

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**ML#12046A869**

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