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NSD-NRC-96-4878
DCP/NRC0654
Docket No.: STN-52-003

November 6, 1996

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: T. R. QUAY

SUBJECT: DESCRIPTION OF POWER SUPPLY TO AP600 HYDROGEN IGNITERS

Dear Mr. Quay:

A meeting was held between Westinghouse and NRC Containment Systems Branch on August 13-14, 1996 to discuss hydrogen issues for AP600. During that meeting, Westinghouse described for the NRC staff the AP600 probabilistic risk assessment modeling of the hydrogen igniters. Additionally, the power supply to the igniters was discussed. The NRC staff reiterated their position, as they presented at the Westinghouse/NRC Senior Management meeting on July 17, 1996, that the hydrogen igniters should not only have an offsite ac power source and an onsite ac power source (via the diesel generators), but should also have the capability to have power supplied from a dc battery power source. Westinghouse's position was that due to the extremely low probability of entering into a situation when the igniters would be needed, and the low probability of igniter system failure, it was not necessary to provide a fourth source of power to the igniters.

Westinghouse continues to believe that a battery supply line to the igniters is unnecessary; however, to close this issue, Westinghouse agrees to provide a fourth source of power to the hydrogen igniters.

Enclosed with this letter is a summary of the proposed power supplies that will be available to the hydrogen igniters. To summarize, the igniters can be powered by the following sources: offsite ac power, two onsite standby diesel generators, and dc power from the non-Class 1E batteries.

The NRC is requested to review the enclosure and provide either their acceptance or comments to Westinghouse within 30 days.

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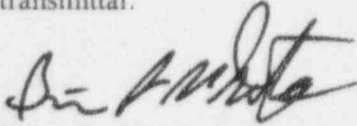
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Please contact Cynthia L. Haag on (412) 374-4277 if you have any questions concerning this transmittal.



Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

/nja

Enclosure

cc: J. Sebrosky, NRC (enclosure)
T. Martin, NRC (w/o enclosure)
A. Thadoni, NRC (enclosure)
J. Kudrick, NRC (enclosure)
N. J. Liparulo, Westinghouse (w/o enclosure)

Enclosure to Westinghouse
Letter NSD-NRC-96-4878

November 6, 1996

BATTERY-BACKED POWER SUPPLY FOR HYDROGEN IGNITERS

DESCRIPTION OF PROPOSED CHANGES

The igniters will be divided into two power groups, such that sufficient coverage is provided if the power supply to one group fails and one group remains functional.

The power feed for the 120/12 Vac hydrogen igniter transformers (ECS-ET-11211, 21211) will be moved from the diesel-backed panels, ECS-EA-1121 & 2121, to the Auxiliary Building non-Class 1E inverter-backed 120 Vac panels EDS1-EA-12 & EDS2-EA-12. This change will provide non-Class 1E battery-backed power to the igniters. All electrical wires, cables and equipment in the igniter circuits are classified as non-Class 1E and are routed as non-safety.

This change will provide battery-backed power to the igniters, as well as off-site power and on-site standby diesel power. The attached sketch shows the power distribution system for one of the two igniter groups. This arrangement will normally provide power to each group of igniters from the preferred off-site ac source through the main step-up transformer, a unit auxiliary transformer, a 4160/480 V load center transformer, a non-Class 1E battery charger to a battery-backed 120 Vdc bus, a non-Class 1E inverter, a 120/12 Vac igniter transformer, and a 12 Vac igniter distribution panel.

In the event of a failure of either the main step-up transformer or a unit auxiliary transformer, an alternate path to the off-site source is available through the reserve auxiliary transformer.

In the event of a failure of a 4160/480 Vac load center transformer, a load center bus, a motor control center, a dc bus, or an inverter, but if offsite ac is available, power to the igniters is automatically supplied through the static switch from the non-Class 1E regulating transformer and a different load center and motor control center.

In the event of loss of the off-site ac source, the standby diesel generators will provide power to the igniters, one group of igniters from each diesel.

In the event of loss of both the off-site source and one of the diesels, power will be provided from the operating diesel to the normally connected igniter group. Power to the other igniter group can be provided through the normally-open, manually-operated cross-connect between load centers ECS-EK-11 and ECS-EK-22.

In the event of loss of both the off-site source and both diesel generators, power is provided to the igniters from the non-Class 1E batteries through the non-Class 1E inverters. One igniter group will be powered from non-Class 1E battery EDS1-DB-1 and inverter EDS1-DU-1. The other igniter group from battery EDS2-DB-1 and inverter EDS2-DU-1.

Each igniter 120/12 Vac transformer power feed will include two parallel normally-open switches that can be closed from the control room, one through the Plant Control System (PLS) and one through the Diverse Actuation System (DAS). This provides redundant control room control of the igniter power. Manual (local) actuation is also available at the switches which are located in the Non-1E Equipment/Penetration Room (near the control room).

The non-Class 1E batteries, inverters and chargers can accommodate the added load within the existing rating.

The power circuits downstream of the 120/12 V transformers will not be changed, i.e., the 12 V output of each transformer is fed to a 12 V power distribution panel (one panel for each transformer) with an individual circuit from the panels for each igniter. This arrangement allows electrical resistance testing of each igniter individually and provides separate fault protection for each igniter.

Sketch of Power Supply for Igniter Group 1 - Sheet 1

Preferred AC Power Supply (offsite)

Maintenance Power Supply

