



May 11, 1993

Docket No. STN 52-001

Chet Poslusny, Senior Project Manager  
Standardization Project Directorate  
Associate Directorate for Advanced Reactors  
and License Renewal  
Office of the Nuclear Reactor Regulation

Subject: Submittal Supporting Accelerated ABWR Review Schedule - **Overpressure Protection**

Dear Chet:

Enclosed is a replacement page (page 3 of 13) for the overpressure protection system SSAR markup of my letter dated May 7, 1993.

Please provide copies of this transmittal to Butch Burton and Bob Palla.

Sincerely,

Jack Fox  
Advanced Reactor Programs

cc: Jack Duncan (GE)  
Norman Fletcher (DOE)  
Bernie Genetti (GE)

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- (16) The primary containment purge system will aid in the long-term post-accident cleanup operation. The primary containment atmosphere will be purged through the SGTS to the outside environment. Nitrogen makeup will be available during the purging operation.
- (17) The system is also designed to release containment pressure before uncontrolled containment failure could occur.

### 6.2.5.2 System Design

#### 6.2.5.2.1 General

The ACS provides control over hydrogen and oxygen generated following a LOCA. In an inerted containment, mixing of any hydrogen generated is not required. Any oxygen evolution from radiolysis is very slow such that natural convection and molecular diffusion is sufficient to provide mixing. Spray operation will provide further assurance that the drywell or wetwell is uniformly mixed. The system consists of the following features:

- (1) Atmospheric mixing is achieved by natural processes. Mixing will be enhanced by operation of the containment sprays, which are used to control pressure in the primary containment.
- (2) The primary containment nitrogen purge establishes and maintains an oxygen-deficient atmosphere ( $\leq 3.5$  volume percent) in the primary containment during normal operation.
- (3) The redundant oxygen analyzer system (CAMS) measures oxygen in the drywell and suppression chamber. Oxygen concentration are displayed in the main control room. Description of safety-related display instrumentation for containment monitoring is provided in Chapter 7. Electrical requirements for equipment associated with the combustible gas control system are in accordance with the appropriate IEEE standards as referenced in Chapter 7.

In addition, the ACS provides overpressure protection to relieve containment pressure, as

required, through a pathway from the wetwell airspace to the stack. The pathway is isolated during normal operation with ~~two~~ rupture disks.

The following modes of operation are provided:

- (1) Startup - Inerting. Liquid nitrogen is vaporized with steam or electric heaters to a temperature greater than 20°F and is injected into the wetwell and the drywell. The nitrogen will be mixed with the primary containment atmosphere by the drywell coolers in the drywell and, if necessary, by the sprays in the wetwell.
- (2) Normal - Maintenance of Inert Condition. A nitrogen makeup system automatically supplies nitrogen to the wetwell and upper drywell to maintain a slightly positive pressure in the drywell and wetwell to preclude air leakage from the secondary to the primary containment. An increase in containment pressure is controlled by venting through the drywell bleed line.
- (3) Shutdown - Deinerting. Air is provided to the drywell and wetwell by the primary containment HVAC purge supply fan. Exhaust is through the drywell exhaust lines and wetwell to the plant vent, through the HVAC or SGTS, as required.
- (4) Overpressure Protection. If the wetwell pressure increases to about <sup>6.3</sup>5.6 kg/cm<sup>2</sup>g, the rupture disks will open. The overall containment pressure decreases as venting continues. Later, the operator can close the two 350A air-operated butterfly valves to re-establishes containment isolation as required. *Closing the two*

The following interfaces with other systems are provided:

- (1) Residual Heat Removal System (RHR-E11). The RHR provides post-accident suppression pool cooling as necessary following heat dumps to the pool, including the exothermic heat of reaction released by the design basis metal-water reaction. This heat of reaction is very small and has no real affect on pool temperature or RHR heat exchanger sizing. The wetwell spray