

50-438 (439)

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TO: Mr Parr

FROM: Tennessee Valley Authority  
Chattanooga, Tn  
J E Gilleland

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DESCRIPTION:  
Ltr re their 10-7-76 ltr....trans the follow:  
  
PLANT NAME: Belefonte 1 & 2

ENCLOSURE  
Design details for ECCS automatic switchover from injection to recirculation operating mode .....(40 cys encl rec'd)  
  
ACKNOWLEDGED

SAFETY FOR ACTION/INFORMATION ENVIRO 8-16-76 ehf

ASSIGNED AD: De Young  
BRANCH CHIEF: Parr  
PROJECT MANAGER: Pyke  
LIC. ASST.: Rushbrook

ASSIGNED AD:  
BRANCH CHIEF:  
PROJECT MANAGER:  
LIC. ASST.:

INTERNAL DISTRIBUTION

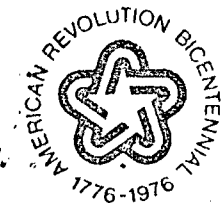
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<input checked="" type="checkbox"/> NRC PDR	HEINEMAN	TEDESCO	ENVIRO ANALYSIS
<input checked="" type="checkbox"/> I & E (2)	SCHROEDER	BENAROYA	DENTON & MULLER
<input checked="" type="checkbox"/> OELD	ENGINEERING	LAINAS	ENVIRO TECH.
<input checked="" type="checkbox"/> GOSSICK & STAFF	MACCARRY	IPPOLITO	ERNST
<input checked="" type="checkbox"/> MIPC	KNIGHT	KIRKWOOD	BALLARD
<input checked="" type="checkbox"/> HANAUER	SIHWEIL	OPERATING REACTORS	SPANGLER
<input checked="" type="checkbox"/> HARLESS	PAWLICKI	STELLO	SITE TECH.
<input checked="" type="checkbox"/> PROJECT MANAGEMENT	REACTOR SAFETY	OPERATING TECH.	GAMMILL
<input checked="" type="checkbox"/> BOYD	ROSS	EISENHUT	STAPP
<input checked="" type="checkbox"/> P. COLLINS	NOVAK (3)	SHAO	HULMAN
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<input checked="" type="checkbox"/> PETERSON	CHECK	BUTLER	VOLLMER
<input checked="" type="checkbox"/> MELTZ	AT & I	GRIMES	BUNCH
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EXTERNAL DISTRIBUTION

LRDR: Scott Shaw, AL  
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ACRS 16 CYS HOLDING/SENT TO LA Rushbrook

BROOKHAVEN NAT-LAB  
ULRIKSON(ORNL)

CONTROL NUMBER  
8242



830 Power Building

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

August 11, 1976

*Regulation 50-438*

Director of Nuclear Reactor Regulation  
Attention: Mr. Olan Parr, Chief  
Branch No. 3  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555



Dear Mr. Parr:

In the Matter of the Application of ) Docket Nos. 50-438  
Tennessee Valley Authority ) 50-439

In accordance with the commitment made in a letter dated October 7, 1974, from J. E. Gilleland to A. Giambusso of the NRC, enclosed for your review are the design details for Bellefonte Nuclear Plant's ECCS automatic switchover from injection to recirculation operating mode.

Very truly yours,

*J. E. Gilleland*  
J. E. Gilleland  
Assistant Manager of Power

Enclosure (40)  
CC: Mr. James McFarland (Enclosure)  
Senior Project Manager  
Babcock & Wilcox Company  
P.O. Box 1260  
Lynchburg, Virginia 24505



8242

ENCLOSURE

BELLEFONTE NUCLEAR PLANT  
ECCS AUTOMATIC SWITCHOVER FROM INJECTION TO RECIRCULATION  
PRELIMINARY DESIGN

The instrumentation to accomplish automatic switchover from the Borated Water Storage Tank (BWST) to the reactor building emergency sump(s) will be incorporated as a part of the Engineered Safety Features Actuation System (ESFAS). As such, it will meet the requirements specified in section 7.3 of the PSAR. The information provided below is a description of the specific instrumentation for accomplishing automatic switchover and does not include a discussion of the general ESFAS requirements contained in the PSAR.

Each analog subsystem of the ESFAS monitors the BWST level as shown in figure 1. The signal from the level transmitter is processed and fed to a buffer amplifier which acts as a signal conditioner and isolation device. This level signal is sent to a low BWST level bistable.

When in the course of a loss-of-coolant accident (LOCA), the BWST level falls below the setpoint of the low BWST level bistable, a signal is sent to a logic buffer. Each logic buffer sends a signal to the 2-out-of-3 coincidence logic in one actuation channel in each digital subsystem.

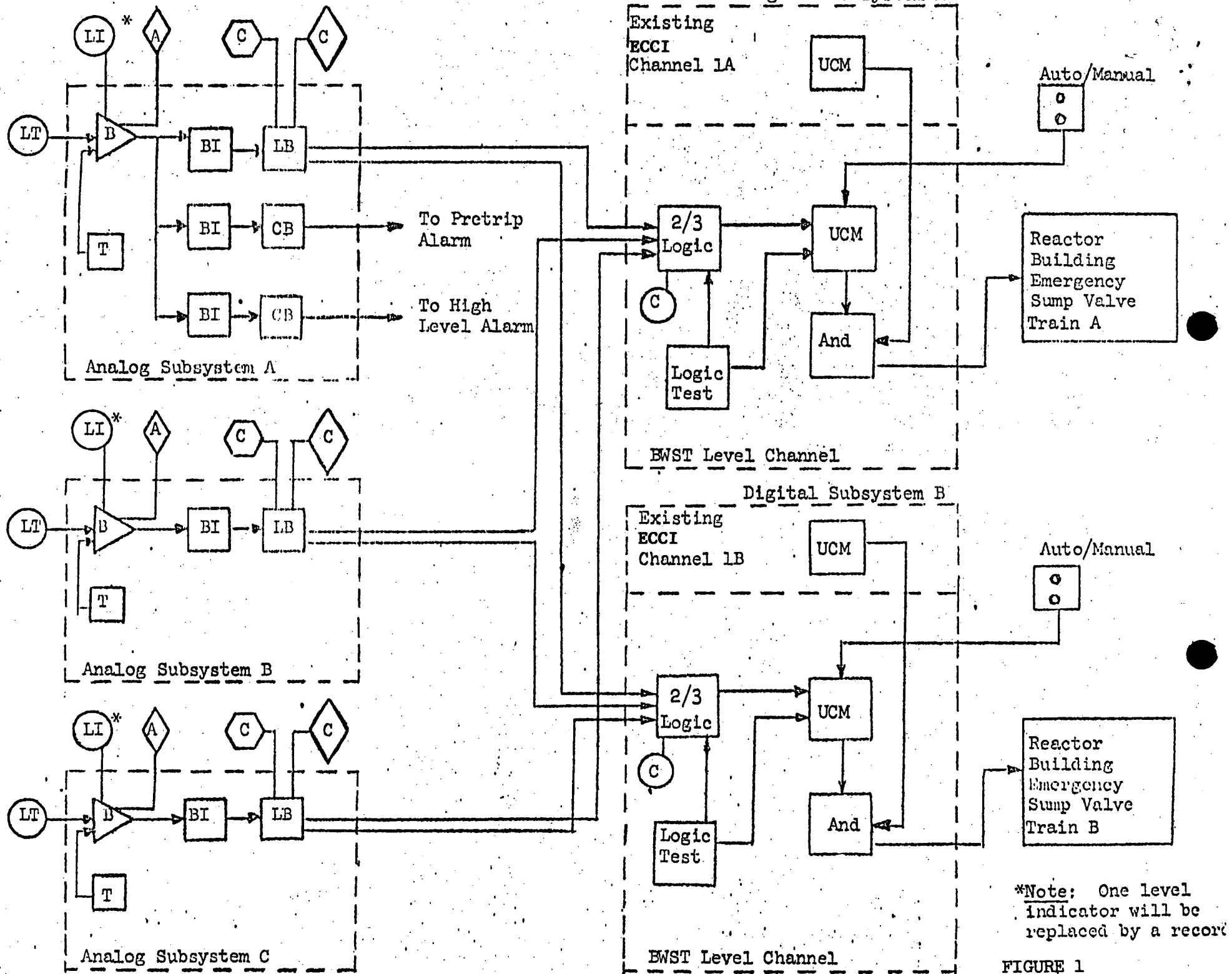
Upon coincidence of low BWST level and an Emergency Core Cooling Instrumentation (ECCI) trip indicating a LOCA, a signal is generated by each digital channel to automatically open the digital channel's associated train reactor building emergency sump valves.

Three level indicators will be provided for monitoring the BWST in the control room.

The following alarms are provided:

- a. Pretrip Alarm--Alarms at a BWST level approaching the trip point (Analog Subsystem A only)
- b. Trip Point Alarm--Provides a signal for the annunciator at the level set for automatic switchover (2-out-of-3 logic from all 3 analog subsystems)
- c. High-Level Alarm--Alarms a high BWST level approaching overflow conditions (Analog Subsystem A only)

The coincidence of the BWST level and ECCI trip prevents automatic opening of the reactor building emergency sump valves when the BWST level is lowered below the setpoint of the bistables during normal shutdown or refueling operations.



\*Note: One level indicator will be replaced by a record

FIGURE 1

FIGURE 1 LEGEND

B - Buffer Amplifier

BI - Bistable

T - Test

LB - Logic Buffer

CB - Contact Buffer

UCM - Unit Control Module

LT - Level Transmitter

LI - Level Indicator

LR - Level Recorder

⊙ - Contacts for Unit Annunciator

◇ - Contacts for Unit Computer

⬡ - Contacts for Sequence of Events Recorder

◊ - Analog Output to Unit Computer