

December 17, 1985

DMB-016

Docket No. 50-346

LICENSEE: Toledo Edison Company
FACILITY: Davis-Besse Nuclear Power Station, Unit No. 1
SUBJECT: SUMMARY OF MEETING - NOVEMBER 26, 1985 ON SFAS MODIFICATIONS

On November 26, 1985, a meeting between Toledo Edison Company and the NPC was held to discuss proposed changes to the Safety Features Actuation System (SFAS) at Davis Besse. The modifications are to resolve an ongoing concern regarding certain shared power returns which bring into question the adequacy of redundant channel independence and compliance with IEEE 279. The issue arose as a result of an event at the station on December 5, 1980. As a result of system reviews being conducted as follows-up to the June 9, 1985 event, Toledo Edison Company determined that this issue should be resolved prior to the unit being returned to power.

Enclosure 1 is the discussion material presented by Toledo Edison Company. Enclosure 2 is a list of attendees.

Toledo Edison plans to make a formal submittal of the proposed modification by the first week of December.

Information which must be submitted for review includes:

- ° Marked up electrical schematic/elementary diagrams of the SFAS changes.
- ° Description of the changes.
- ° Testing procedures that will be used to demonstrate electrical independence between redundant SFAS instrument channels following the modifications.
- ° Discuss the periodic surveillance (monitoring) to be performed on the floating returns following the modifications.

Original signed by

Albert De Agazio, Project Manager
PWR Project Directorate #6
Division of PWR Licensing-B

Enclosures:
As stated

cc w/enclosures:
See next page

PBD-6
A De Agazio
12/17/85

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PDR ADOCK 05000346
P PDR

TOLEDO EDISON COMPANY
DAVIS-BESSE NUCLEAR POWER STATION
UNIT 1

SAFETY FEATURES ACTUATION SYSTEM
CHANNEL INDEPENDENCE

MEETING AGENDA: Safety Features Actuation System
Channel Independence

PLACE: B&W Offices, Suite 220
7910 Woodmont Avenue
Bethesda, Maryland

TIME: November 26, 1985
9:00 am

PURPOSE: Proposed Upgrade to SFAS

(SLIDE 1)
1a

I. Description of Davis-Besse SFAS
(See Attached)

(SLIDE 2)

II. Description of December 5, 1980 Event
(Narrative Attached)

III. Options Available

(SLIDE 3)

1. Monitor for Ground Faults

(SLIDE 4)

2. Tie Floating Common to Ground

(SLIDE 5)
5a,b

3. Physically Separate Commons Between
Channels

(SLIDE 6)
6a,b

4. Separate Sensor Channel Commons

IV. Implementation Schedule

A. Package Preparation By 11/30/85

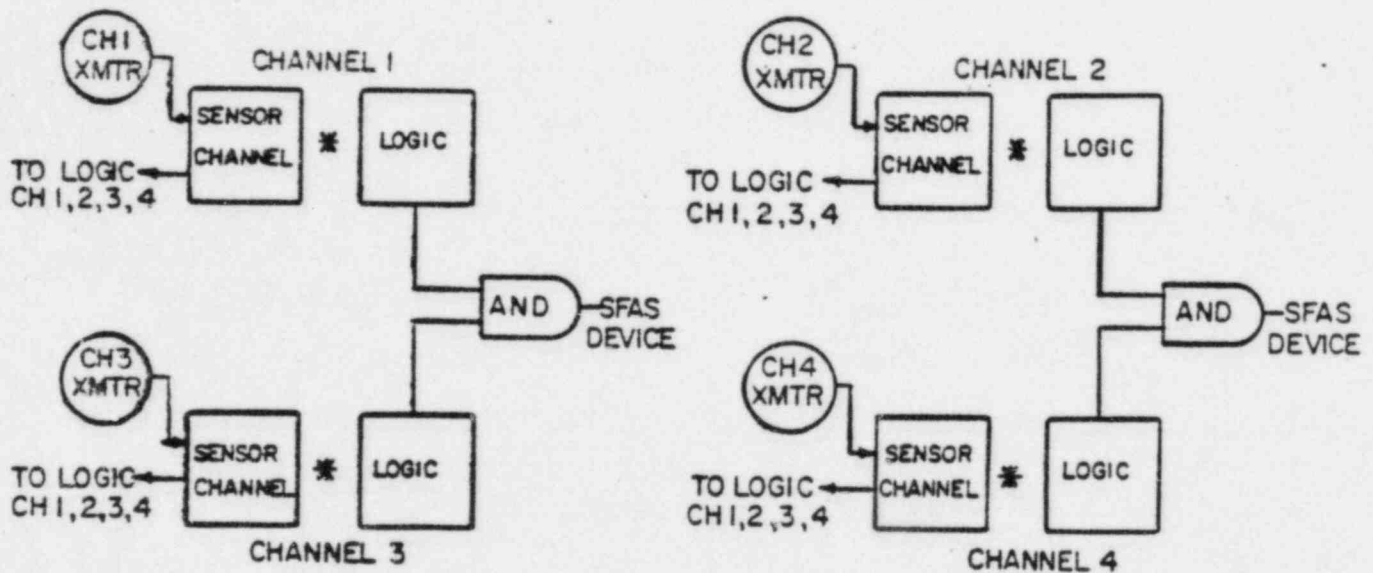
B. Installed Post-Modification Tests
Complete By 12/15/85

C. Following Implementation, SFAS Monthly
and 18-Month Tests Will Be Run

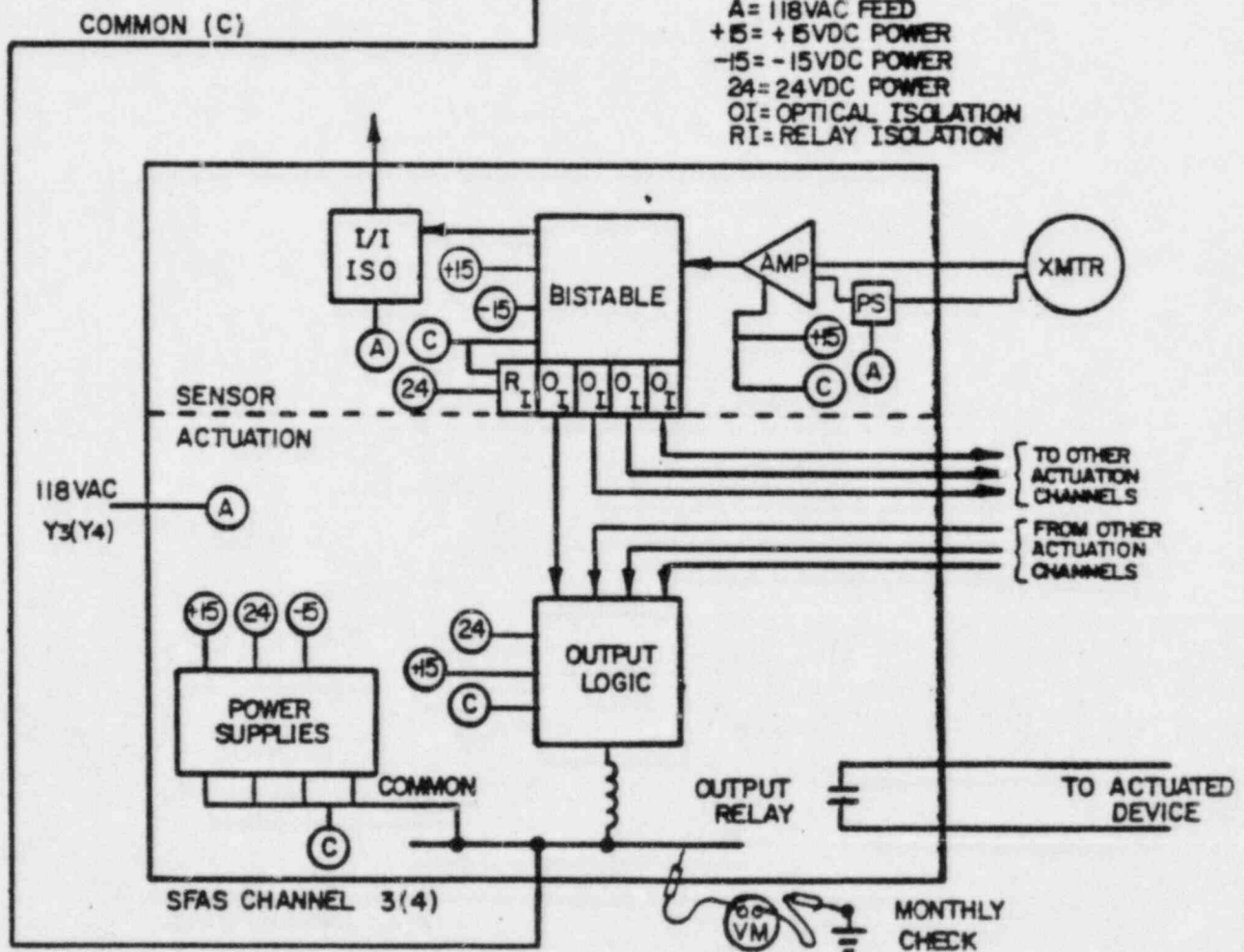
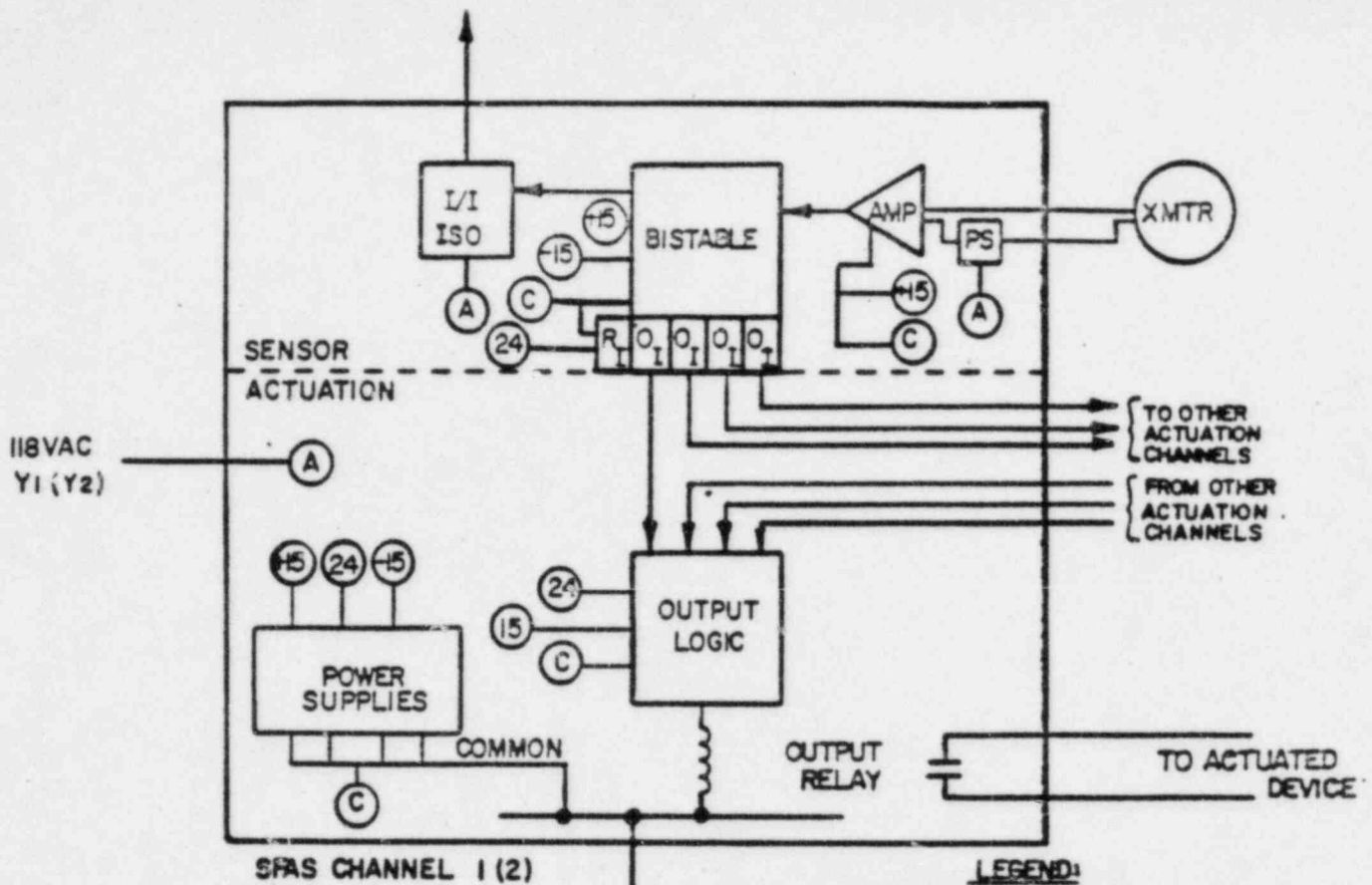
V. Questions and Answers

VI. NRC Staff Feedback

SFAS - AS CURRENTLY WIRED

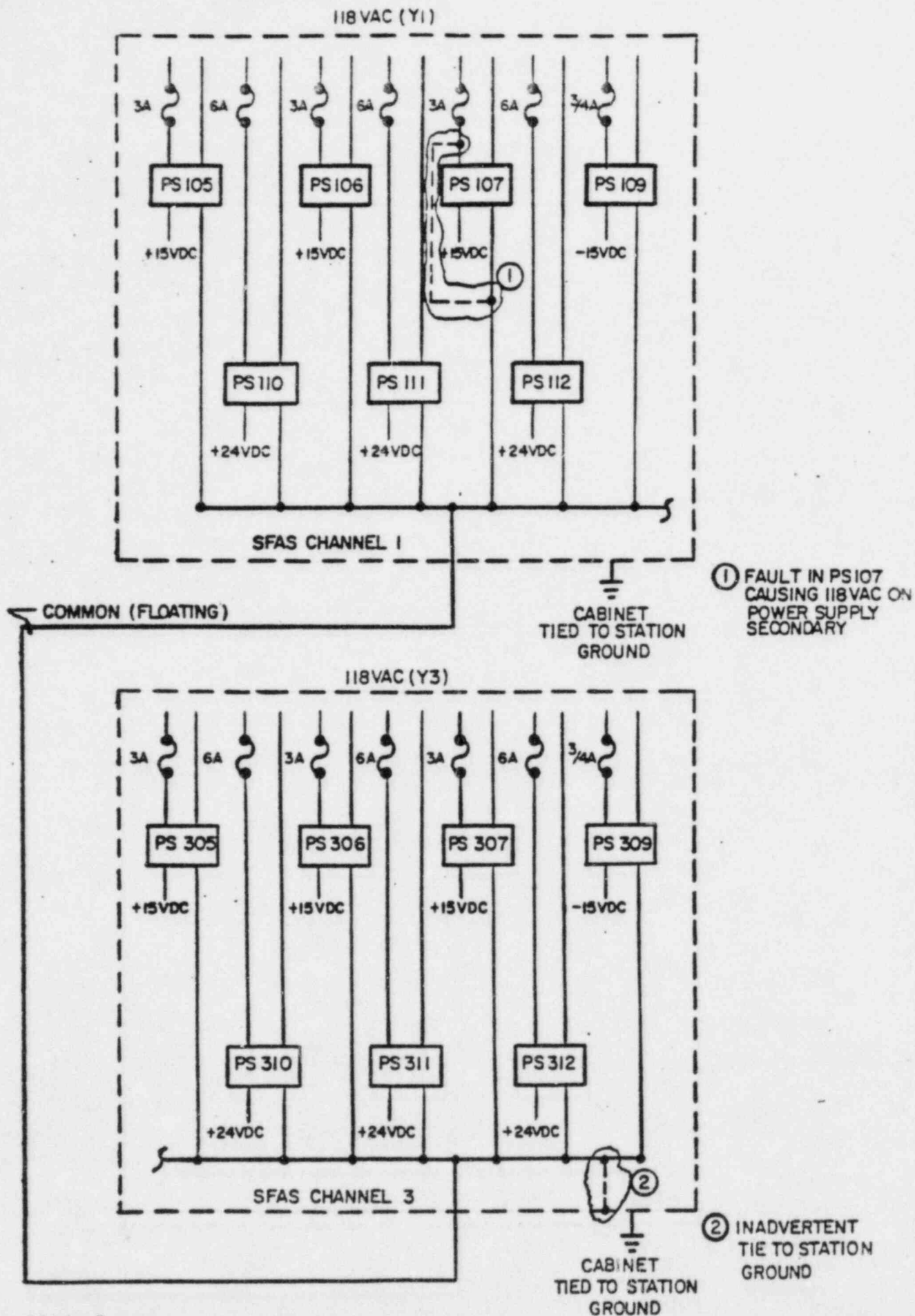


* SENSOR CHANNEL OPTICALLY
ISOLATED FROM LOGIC CHANNEL



NARRATIVE OF DECEMBER 5, 1980 EVENT

1. Plant was in shutdown condition, following a December 3, 1980 reactor trip due to DC ground fault (outside SFAS).
2. Shortly after December 3 trip, a ground fault was identified in SFAS. This fault caused SFAS SAM lights which are normally off to flicker on.
3. In the course of troubleshooting, SFAS Channel 3 was de-energized. This channel was chosen randomly, as fault was either in Channel 1 or Channel 3.
4. Channel 3 was re-energized. Channel 3 bistables were still in a tripped state, which is normal following loss of power.
5. One Channel 3 output module had a light out. When bulb was removed, an inadvertent tie between cabinet (station ground) and power supply common occurred (this is functionally shown as 2).
6. This inadvertent tie caused 3 amp AC supply fuse to power supply PS 107 to blow. This was due to the failure of PS 107 (functionally shown as 1) in which a fault in supply caused 118 VAC on power supply secondary (DC) side.
7. Loss of PS 107 caused Channel 1 bistables to trip. Since Channel 3 bistables were already tripped, a 2-out-of-4 condition resulted, causing a full SFAS actuation.



OPTION: MONITOR FOR GROUND FAULTS

ADVANTAGES

- DOES NOT COMPROMISE SYSTEM RELIABILITY.
- CURRENTLY BEING DONE ON A MONTHLY BASIS.

DISADVANTAGES

- REDUCES SFAS TO A TWO CHANNEL SYSTEM.
- DETECTION OF A FAULT AFFECTING TWO SENSOR CHANNELS MUST BE PHYSICALLY CLEARED.

Slide 3

OPTION: TIE COMMON TO GROUND

ADVANTAGES

- ASSURES THAT SFAS IS IMMUNE TO A SINGLE FAILURE WHICH COULD AFFECT TWO SENSOR CHANNELS.
- CHANGE REQUIRES NO NEW OR COMPLICATED HARDWARE.
- CHANGE IS SIMPLE TO ACCOMPLISH.
- PROVIDES POSITIVE RESULTS. IF A FAULT OCCURS IT IS IMMEDIATELY CLEARED, AND WILL RESULT IN A TRIP OF CHANNEL CONTAINING FAULT.

DISADVANTAGES

- CHANGE MAKES SFAS MORE SUSCEPTIBLE TO SPURIOUS TRIPS.
- POTENTIAL PERSONNEL SAFETY PROBLEMS.

OPTION: PHYSICALLY SEPARATE COMMONS BETWEEN CHANNELS

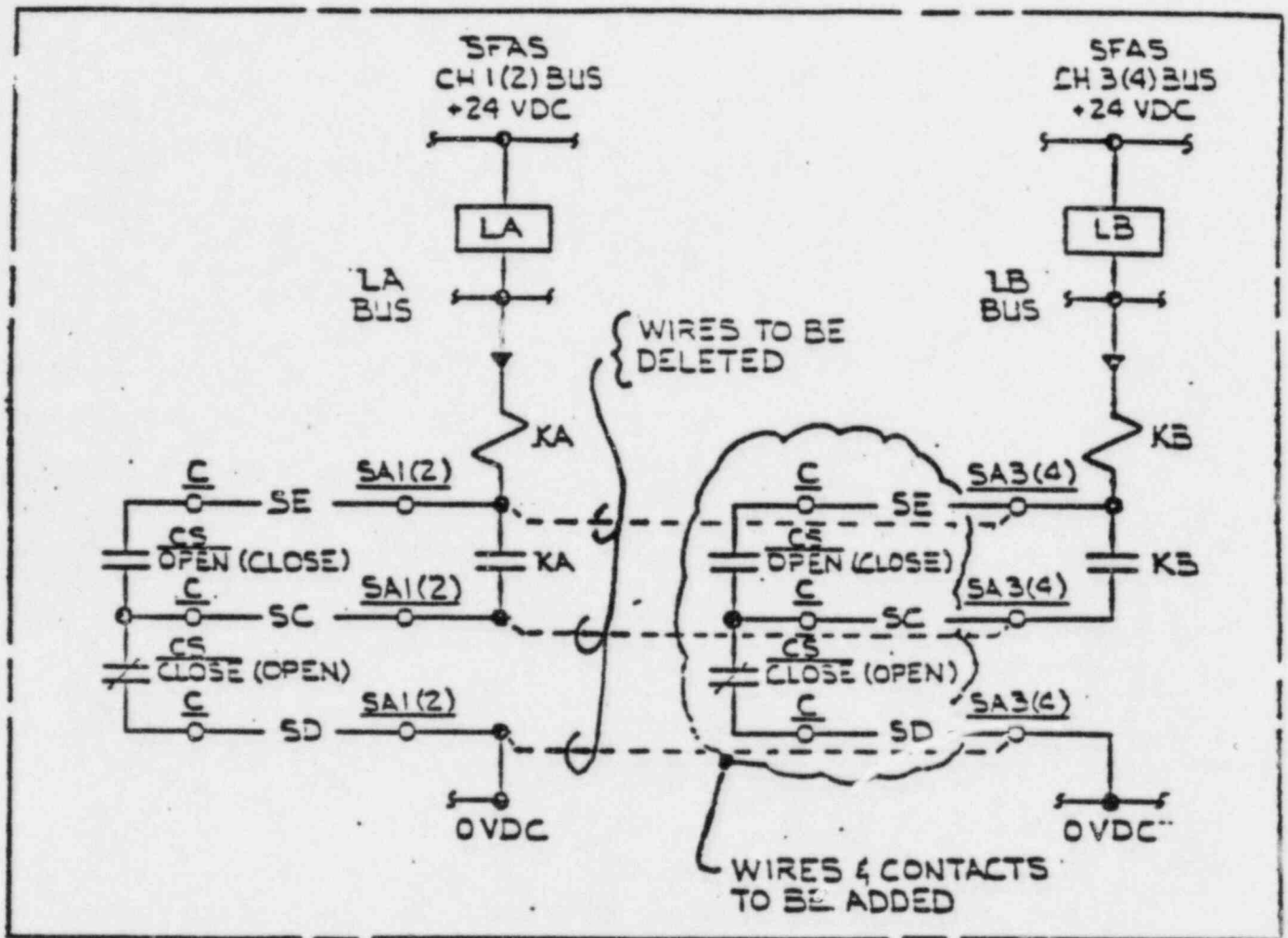
ADVANTAGES

- ASSURES THAT SFAS IS IMMUNE TO A SINGLE FAILURE WHICH COULD AFFECT TWO SENSOR CHANNELS.
- DOES NOT MAKE SFAS MORE SUSCEPTIBLE TO SPURIOUS TRIPS OR EQUIPMENT DAMAGE.

DISADVANTAGES

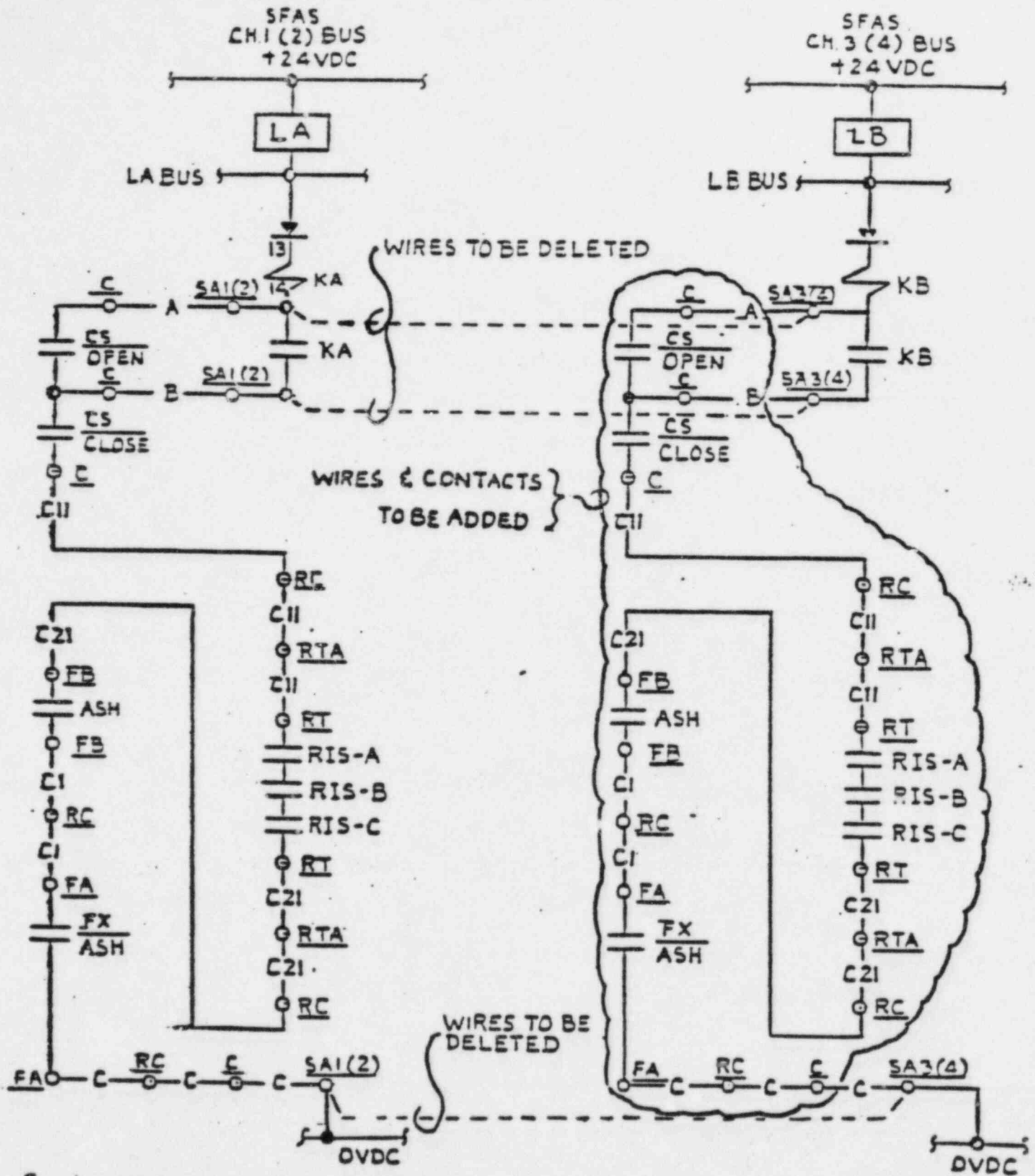
- EXTENSIVE FIELD WIRING AND HARDWARE REQUIRED.
- CURRENT SYSTEM SPACE LIMITATIONS WOULD NOT ALLOW FOR ADDITIONAL TERMINATIONS REQUIRED.
- SYSTEM RELIABILITY REDUCTION.

PHYSICALLY SEPARATED COMMONS BETWEEN CHANNELS



(REFLECTS REVISION REQUIRED TO DWG. E-30B, SH. 4)

PHYSICALLY SEPARATED COMMONS BETWEEN CHANNELS



[REFLECTS REVISION REQUIRED TO DWG E-60B, SH. 14D (ELEM. ONLY)]

OPTION: SEPARATION OF SENSOR CHANNEL COMMONS
(TED PREFERRED OPTION)

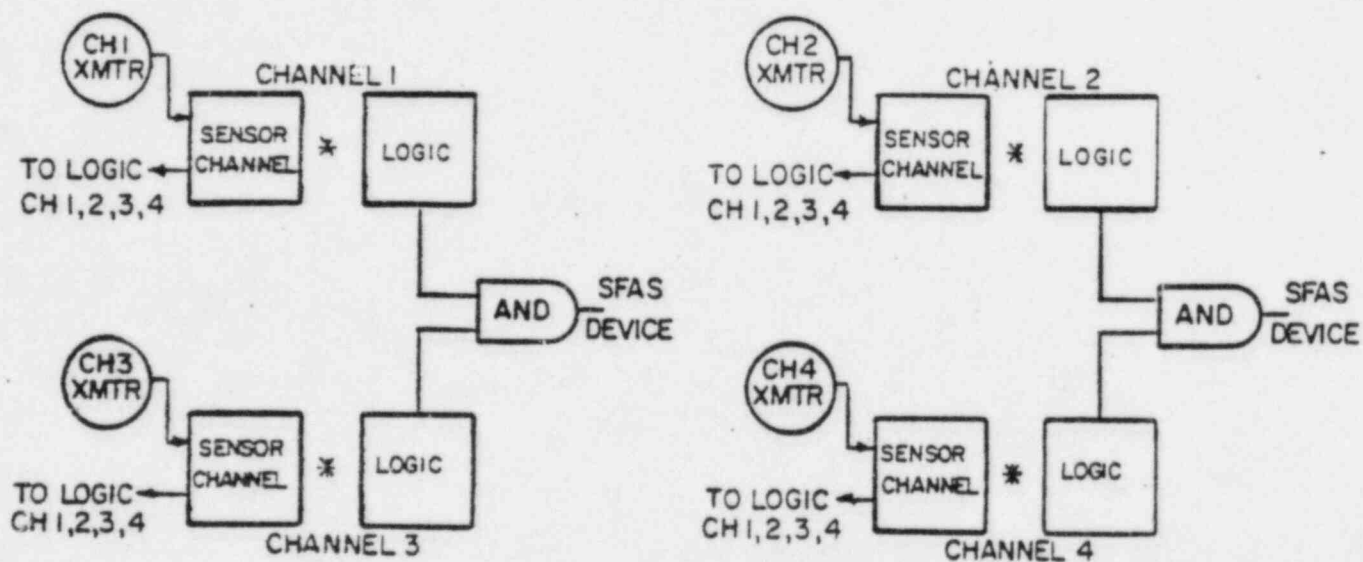
ADVANTAGES

- ASSURES THAT SFAS IS IMMUNE TO A SINGLE FAILURE WHICH COULD AFFECT TWO SENSOR CHANNELS.
- DOES NOT MAKE SFAS MORE SUSCEPTIBLE TO SPURIOUS TRIPS OR EQUIPMENT DAMAGE.
- REQUIRES NO FIELD WIRING CHANGES.

DISADVANTAGES

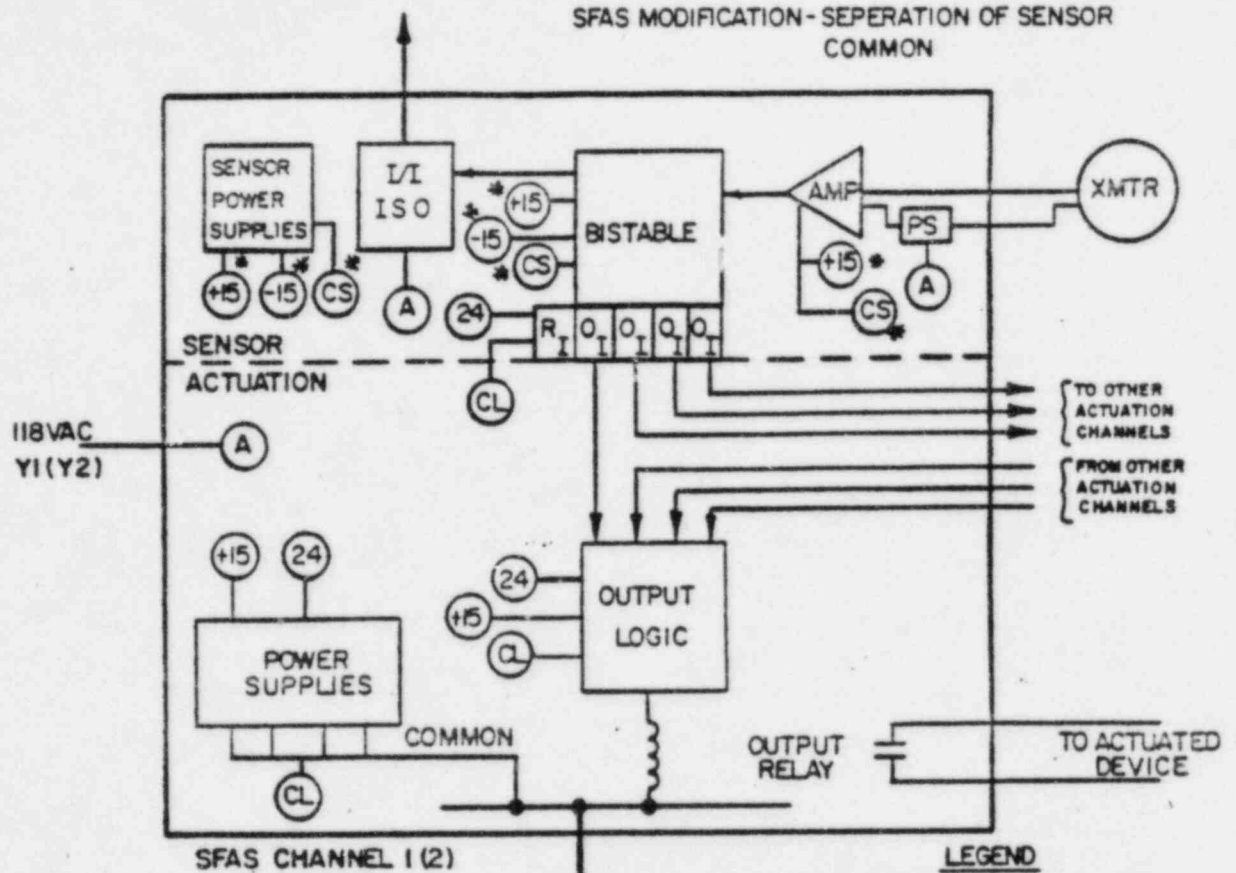
- REQUIRES VERY AMBITIOUS SCHEDULE TO ALLOW INSTALLATION PRIOR TO PLANT RESTART.

SFAS - AS PROPOSED



* SENSOR POWER SUPPLY ISOLATED FROM LOGIC POWER SUPPLY
SENSOR CHANNEL OPTICALLY ISOLATED FROM LOGIC CHANNEL

SFAS MODIFICATION - SEPERATION OF SENSOR COMMON

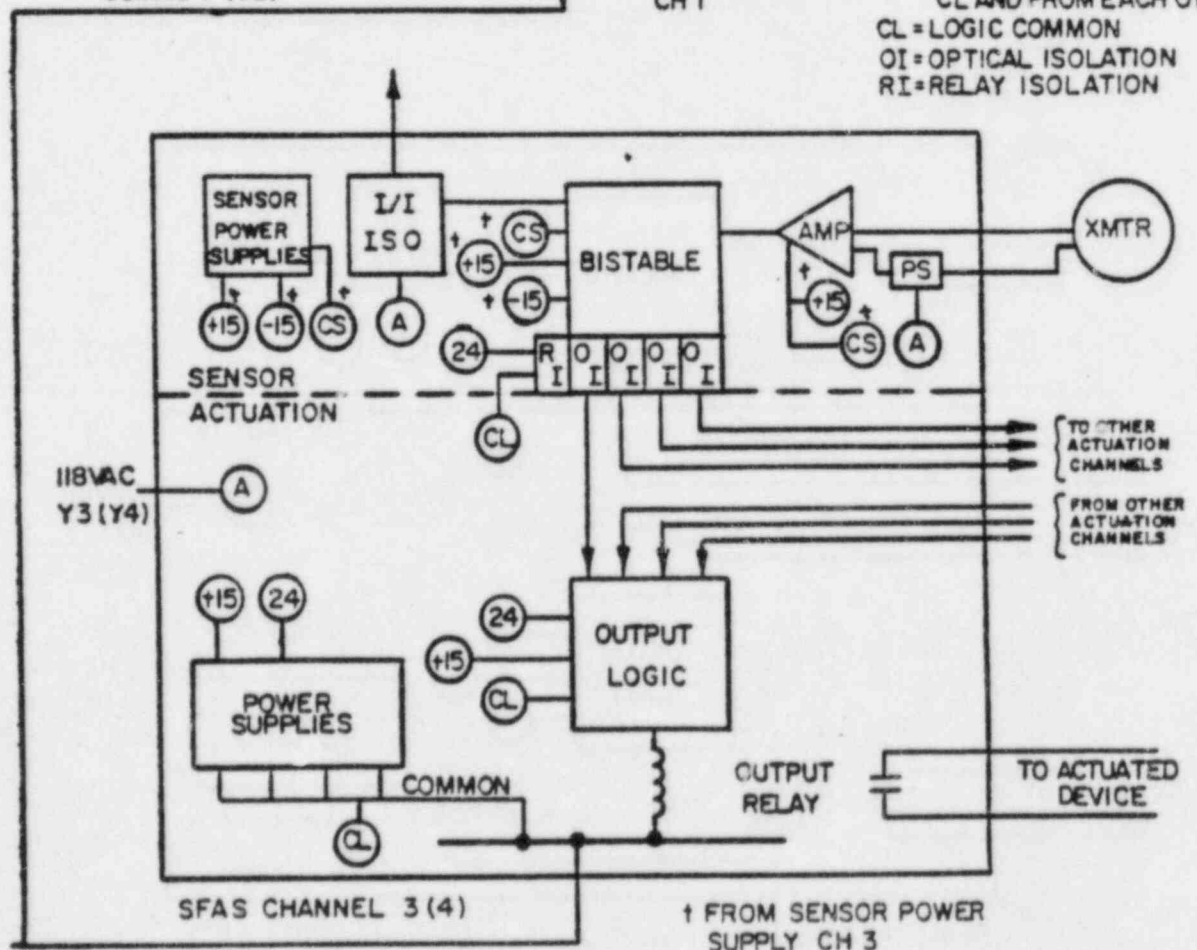


LEGEND

* FROM SENSOR POWER SUPPLY CH 1

CS = SENSOR COMMON
(CH 1 & CH 3 ISOLATED FROM CL AND FROM EACH OTHER)
CL = LOGIC COMMON
OI = OPTICAL ISOLATION
RI = RELAY ISOLATION

COMMON (CL)



† FROM SENSOR POWER SUPPLY CH 3

November 26, 1985

TOLEDO EDISON/NRC MEETING

S F A S

ATTENDEES

| <u>NAME</u> | <u>ORGANIZATION</u> |
|--------------------|-----------------------------|
| ALBERT W. DEAGAZIO | NRC |
| SUSHIL C. JAIN | TED |
| CONRAD MCCrackEN | NRC/PDB 6 |
| JACK R. GRIGG | BETA |
| DALE R. WUOKKO | TED/NLD |
| GEORGE GARRITY | CONSOLIDATED CONTROLS CORP. |
| CHRIS KAHN | TED/I&C ENGR. |
| GEORGE DICK | NRR/PD 6 |
| RICK KENDALL | NRR/PEICSB |
| OLAN PARR | NRR/PEICSB |
| LARRY STALTER | TED |
| BOB PETERS | TED/NLD |

MEETING SUMMARY DISTRIBUTION

Licensee: Toledo Edison Company

*Copies also sent to those people on service (cc) list for subject plant(s).

Docket File

NRC PDR

L PDR

PBD-6 Rdg

JPartlow (Emergency Preparedness only)

JStolz

ADe Agazio

OELD

EJordan

BGrimes

ACRS-10

NRC Participants

CMcCracken

GDick

RKendall

OParr