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Regulatory Docket File

June 14, 1976

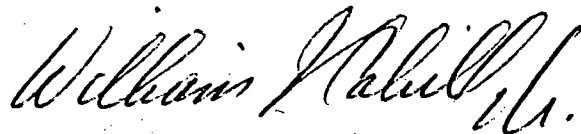
Re: Indian Point Unit No. 2  
Docket No. 50-247

Director of Nuclear Reactor Regulation  
ATTN: Mr. Robert W. Reid, Chief  
Operating Reactors Branch # 4  
Division of Operating Reactors  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Gentlemen:

Attached to this letter is the additional information which was requested during a meeting between members of our staffs on June 10, 1976 regarding the electrical single failure criteria review for Indian Point Unit No. 2.

Very truly yours,

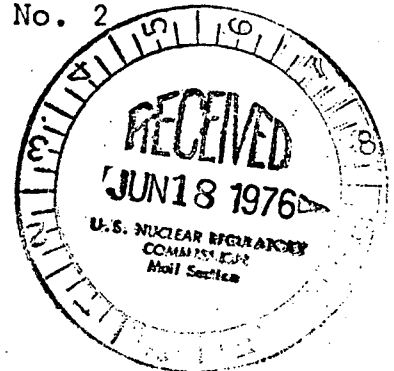
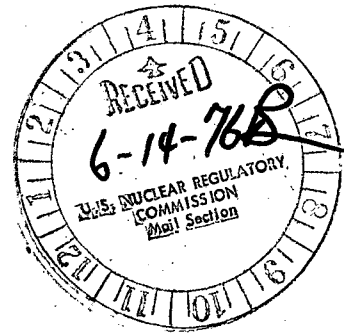


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WJC:nvg

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PDR



1. D.C. Ground Detection System (Westinghouse Drawing 3373D70)

The Indian Point 2, 125V DC ground detection system consists of a ground detection relay and two white lights with one side of the ground relay and the common point between the white lights connected to ground. The system is part of the 25 Kw, 200 amp. Westinghouse Rectomatic Battery Chargers which are connected to the 125V DC power panels 21 and 22. When no grounds are present the ground relay is deenergized and both white lights will burn dimly. If a ground is present on a bus, the light connected to that bus will go out and the other light will burn brightly. The ground relay will also energize a common "Battery Charger Trouble" alarm on the SH panel in the Central Control Room. The "Battery Charger Trouble" alarm annunciates on loss of AC voltage, low DC voltage and/or DC ground. Upon appearance of the alarm, station personnel are dispatched to investigate the source of the problem. A test procedure for the ground detection system will be incorporated in the periodic battery testing program.

## 2. Safeguards Logic Relays

As was stated during meetings in Bethesda on June 10, 1976, at Indian Point Unit No. 2 two redundant logic systems (each capable of automatically sequencing safeguards loads on all 3 power trains) have been provided. Redundant sequencing relays (e.g. "3-4" and "3-14") and sequencing timers (e.g. "2-SI-1" & "2-SI-3") are located in separate cabinets in the control room (refer to drawing 110E089 sheet 10 of 10', enclosed). For Power Train 3 (bus 2A-3A) sequencing timers for alternate power supplies within the same power train (e.g. "2-SI-2B" and "2-SI-2A") are also located in separate cabinets.

Sequencing relays are Westinghouse type BFD DC relays rated at 250 volts (see enclosed copy of Westinghouse Catalog 25-000 page 226). Due to the physical construction of these relays (horizontal mounting and "double break" contacts) it is virtually impossible to short across any individual contact. Terminals for each individual contact are in vertical alignment at the top and bottom (as shown on the enclosed catalog sheet). The construction of these relays also includes inset terminals which minimize any potential for shorts between adjacent contacts.

3. The following drawings are being provided for your use:

- \* (a) Westinghouse Catalog 25-000, page 226.
- \* (b) Drawing No. 110 E 089, sheet 10 of 10.
- \* (c) Drawing No. 3373 D 70.
- \*\* (d) Drawing No. 9321 - LL - 3117 (complete set).
- \*\* (e) Drawing No. 9321 - LL-3118 (complete set).
- \*\* (f) Drawing No. 110 E 089 (complete set).

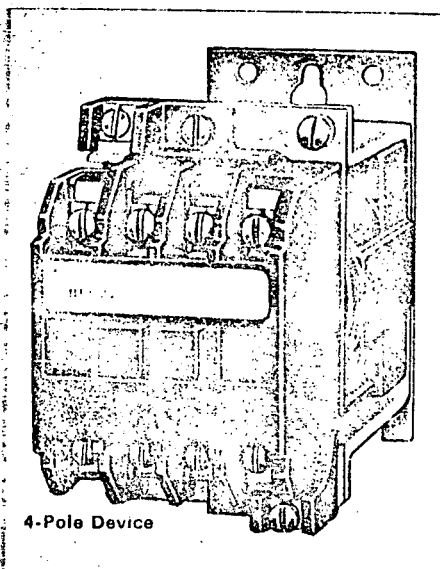
\* 7 copies enclosed.

\*\* Copies provided to Regulatory Staff during June 10, 1976 meeting.

# Control Components

## Industrial Control Relays

### Type BFD Dc Relay



#### Description

The Type BFD is a Dc operated relay, available in any combination of normally open and normally closed poles, from two to 12, with a maximum of 12 normally open or eight normally closed. Although the base plate is integral with the magnet, it is exactly the same size as the base plate on all other BF-relays. All panel drillings are the same for either Ac or Dc relays.

A solid state timer is available for use with the BFD relay. See Page 218.

Type BFD Dc operated relays can be supplied complete with factory-installed Dc latch. Specify Dc voltage. Order by description and add \$28 list to BFD relay Price.

Dc latches have intermittent duty coils.

#### Dc Ratings

##### Inductive Loads

Two poles in series: 2.2 amps at 125 volts, 1.1 amps at 250 volts.

Single pole: 1.1 amps at 125 volts, .55 at 250 volts.

##### Resistive Loads

Single pole: 3 amps at 125 volts, 1.5 amps at 250 volts.

Pick-up time: 25 to 40 milliseconds, depending on contact arrangement.

Drop-out time: 15 to 25 milliseconds, depending on contact arrangement.

Coil power: 12 watts, 250 volts maximum.

#### List Prices

##### Dc Devices, 250 Volts Maximum

Number of Poles	Contacts N. O.	N. C.	Catalog Number②	List Price
<b>Universal Contact</b>				
2	2	2	BFD22S	\$38
3	3	3	BFD33S	42
4	4	4	BFD44S	46
6	6	6	BFD66S	54
6	6	4	BFD64S	54
6	6	6	BFD66S	62
8	8	4	BFD84S	62
<b>Fixed Contact</b>				
2	2	0	BFD20S	34
	1	1	BFD11S	34
	0	2	BFD02S	34
3	3	0	BFD30S	38
	2	1	BFD21S	38
	1	2	BFD12S	38
	0	3	BFD03S	38
4	4	0	BFD40S	42
	3	1	BFD31S	42
	2	2	use Universal 2-pole	
	1	3	BFD13S	42
	0	4	BFD04S	42
6	6	0	BFD60S	46
	5	1	BFD51S	46
	4	2	BFD42S	46
	3	3	use Universal 3-pole	
	2	4	BFD24S	46
	0	6	BFD06S	46
8	8	0	BFD80S	54
	7	1	BFD71S	54
	6	2	BFD62S	54
	5	3	BFD53S	54
	4	4	use Universal 4-pole	
	0	8	BFD08S	54
10	10	0	BFD100S	62
	8	2	BFD82S	62
	7	3	BFD73S	62
	6	4	use Universal 6-pole	
	5	5	use Universal 5-pole	
	4	6	BFD46S	62
	2	8	BFD28S	62
12	12	0	BFD120S	70
	8	4	use Universal 8-pole	
	7	5	BFD75S	70
	6	6	use Universal 6-pole	
	5	7	BFD57S	70
	4	8	BFD48S	70

All relays listed are available with dual tabs for AMP FASTON® Push-On terminals at no extra cost - order by description.

\* Trademark of AMP Incorporated.

#### Enclosures

For dimensions, refer to Page 231.

Description	Poles	Style Number	List Price
NEMA 1	4-8	4977D40G04	\$ 8
NEMA 1	10-12	4977D40G05	10
NEMA 12	4-8	5680D43G01	48
NEMA 12	10-12	5680D43G02	48

② Catalog numbers listed are for 120 volts Dc. For 240 volts, see Ordering Information.

#### Ordering Information

Order by catalog number. Devices listed have 120 volt Dc coils. For other coil voltages, substitute the letter shown in the table below for the letter S in the catalog number. Replacement coils are listed on page 231.

Suffix Letter	Volts Dc
C	6
D	12
L	24
Y	48
B	95
T	240

#### Dimensions, Inches

Not to be used for construction purposes unless dimensions are approved.

