

# **Technical Bulletin**

An advisory of a recent technical development pertaining to the installation or operation of Westinghouse-supplied nuclear plant equipment.  
 Recipients should evaluate the information and recommendation, and initiate action where appropriate.  
 P.O. Box 355, Pittsburgh, PA 15230

Subject: <b>Basler Power Supplies</b>		Number: <b>TB-02-5</b>
System(s): Solid State Protection System, Digital Rod Position Indication		Date: 07/12/2002
Affected Plants: See Sheet 3		S.O.(s):
References: N/A	Affects Safety    Yes <input checked="" type="checkbox"/> Related            No <input type="checkbox"/> Equipment	Sheet: 1 of 3

**BACKGROUND**

Recently a plant had a 48-Volt power supply (2374A07G01) in the Solid State Protection System (SSPS) trip its output breaker. This caused a system non-urgent alarm (General Warning) in the train with the tripped power supply. The tripped power supply was replaced and sent to their lab for repair. The power supply operated normally and initially no apparent fault could be found. Further investigations by their repair facility noted small metallic “whiskers” on the outside cases of the R11 and R13 variable resistors located on the voltage regulator board inside the power supply. R11 is used to set the overcurrent setpoint and R13 is used to set the overvoltage setpoint within the power supply. These power supplies were manufactured for Westinghouse by Basler Electric.

These variable resistors or potentiometers are coated with tin to prevent corrosion. The metallic “whiskers” seen on these potentiometers are tin and can spontaneously occur when pure tin is present. In this case, it is assumed that the “whiskers” were of sufficient length to cause a short between the cases of the two potentiometers. When the cases of these two potentiometers are shorted together, the overvoltage setpoint circuit actuates and trips the output breaker. This short circuit vaporizes the small whiskers, thus eliminating the cause of the fault.

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Additional information, if required, may be obtained from the originator. Telephone 724-722-5430 or (WIN) 224-5430

Originator

Approved

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Westinghouse has determined that the inside of the potentiometer is not affected and that covering the outside of the case of the potentiometer eliminates the spontaneous growth of the tin “whiskers”. The outside can be coated with a suitable heat shrink (any type, ¾ inch, is acceptable) or a light coat of any type humi-seal sealant.

There have been four cases of power supply trips in the Solid State Protection System that have had no apparent cause identified. Westinghouse has determined there is a potential for similar instances to occur with the Basler power supplies. The following Basler power supply models are affected by this technical bulletin:

2374A07G01	Dual +15/+48 Volt power supply
2374A07G02	Single +15 Volt power supply
2374A07G03	Single +48 Volt power supply
2374A07G04	Single +48 Volt power supply
2374A07G05	Single +15 Volt power supply
2374A07G06	Single +48 Volt power supply
2374A07G07	Dual +15/+48 Volt power supply
2374A07G08	Single +15 Volt power supply
2374A07G09	Single +48 Volt power supply
2374A07G10	Single +48 Volt power supply
2384A38H01	Dual +15/+48 Volt power supply
2376A52G01	Dual +15 Volt power supply (Digital Rod Position Indication System)

## **RECOMMENDATIONS**

Westinghouse makes the following recommendations:

1. During the next refueling outage, inspect the affected installed power supplies to determine if “whiskers” are present on R11 and R13. Clean the two potentiometers by using a soft bristle brush to remove any “whiskers” that may be present. After cleaning, cover each potentiometer with ¾ inch heat shrink around the outside case or lightly coat the external case of the potentiometer with humi-seal coating.
2. At the earliest opportunity, inspect R11 and R13 of any affected power supplies that may be in spare parts inventory. Clean and cover each potentiometer with ¾ inch heat shrink around the outside case or lightly coat the external case of the potentiometer with humi-seal coating.

Westinghouse does not consider the spontaneous “whisker” growth on these potentiometers to be a safety issue. If the “whiskers” do short between the cases of R11 and R13, the output breaker trips to place the power supply in the off state. This condition is considered to be the fail-safe desired state.

### **Affected Plants – Solid State Protection System**

AEP/AMP – D.C. Cook 1 & 2	CAE/CBE – Byron 1 & 2
ALA/APR – J. M. Farley 1 & 2	CCE/CDE – Braidwood 1 & 2
ANG – Angra 2	CGE – V.C. Summer
ARZ/ASZ – Almaraz 1 & 2	CQL – Shearon Harris
DAP/DBP – McGuire 1 & 2	EAS – Vandellos 2
DCP/DDP – Catawba 1 & 2	FEY/FFY – ASCO 1 & 2
DLW/DMW – Beaver Valley 1 & 2	GAE/GBE – Vogtle 1 & 2
KGA/KHB – Ko-Ri 3 & 4	NAH – Seabrook 1
KPR – Ko-Ri 2	NEU – Millstone 3
KRK – Krsko	OHI/OKB – Kobe 1 & 2
KSR/KTR Yonggwang 1 & 2	PGE/PEG – Diablo Canyon 1 & 2
TBX/TCX – Comanche Peak 1 & 2	PSE/PNJ – Salem 1 & 2
TEN/TVA – Sequoyah 1 & 2	SAP – Wolf Creek
TGX/THX – South Texas Project 1 & 2	SCP – Callaway
TWP/TXP – Maanshan 1 & 2	SSP/STP/SUP – Ringhals 2, 3, 4
VRA/VGB – North Anna 1 & 2	WAT – Watts Bar 1

### **Affected Plants – Digital Rod Position Indication**

ALA/APR – J. M. Farley 1 & 2	ANG – Angra 2
ARZ/ASZ – Almaraz 1 & 2	EAS – Vandellos 2
CAE/CBE – Byron 1 & 2	CCE/CDE – Braidwood 1 & 2
CGE – V.C. Summer	CQL – Shearon Harris
DAP/DBP – McGuire 1 & 2	DCP/DDP – Catawba 1 & 2
FEY/FFY – ASCO 1 & 2	DMW – Beaver Valley 2
GAE/GBE – Vogtle 1 & 2	KGA/KHB – Ko-Ri 3 & 4
NAH – Seabrook 1	KPR – Ko-Ri 2
NEU – Millstone 3	KRK – Krsko
OHI/OKB – Kobe 1 & 2	KSR/KTR Yonggwang 1 & 2
PGE/PEG – Diablo Canyon 1 & 2	TBX/TCX – Comanche Peak 1 & 2
SAP – Wolf Creek	TGX/THX – South Texas Project 1 & 2
SCP – Callaway	TWP/TXP – Maanshan 1 & 2
STP/SUP – Ringhals 3 & 4	