

# Pixel Failure Modes - Local

DOCDB 404-v1

PIXEL FAILURE MODES Lucien Cremaldi

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Problem (Local)	Siemens	FEC/DCU	FED	Chiller Plant	CAEN	GC/MS
	T / %H	Temp	Temp/Rate	Flow/Wght	$\Delta$ I-Current	%Gas
6-U cooling loop failure (small leak )	$\Delta T < 2$	$\Delta T < 2$	$\Delta T < 2$	0	0	%FC
6-U cooling loop failure (large leak/break/blocked )	$\Delta T > 50$	$\Delta T > 50$	$\Delta T > 50$	0	0	%FC
Supply line failure (small leak)	$\Delta T < 2$	$\Delta T < 2$	$\Delta T < 2$	0	0	%FC
Supply line failure (large leak/break/blocked)	$\Delta T > 50$	$\Delta T > 50$	$\Delta T > 50$	FLOW	$\Delta I$	%FC
Poor contact between frame and pipe.	$\Delta T < 2$	$\Delta T < 2$	$\Delta T < 2$	0	0	
%Humidity increase	%H	0	0	0	0	%H2O
Local HV/LV Dead Short	$\Delta T$	$\Delta T$	$\Delta T$	0	$\Delta I$	0
Local HV/LV Leakage Current High	$\Delta T$	$\Delta T$	$\Delta T$	0	$\Delta I$	
Excessive Plaquette Vibration	Accelerometer					
Noise/Grounding Loop			RATE		$\Delta I$	

# Pixel Failure Modes - Global

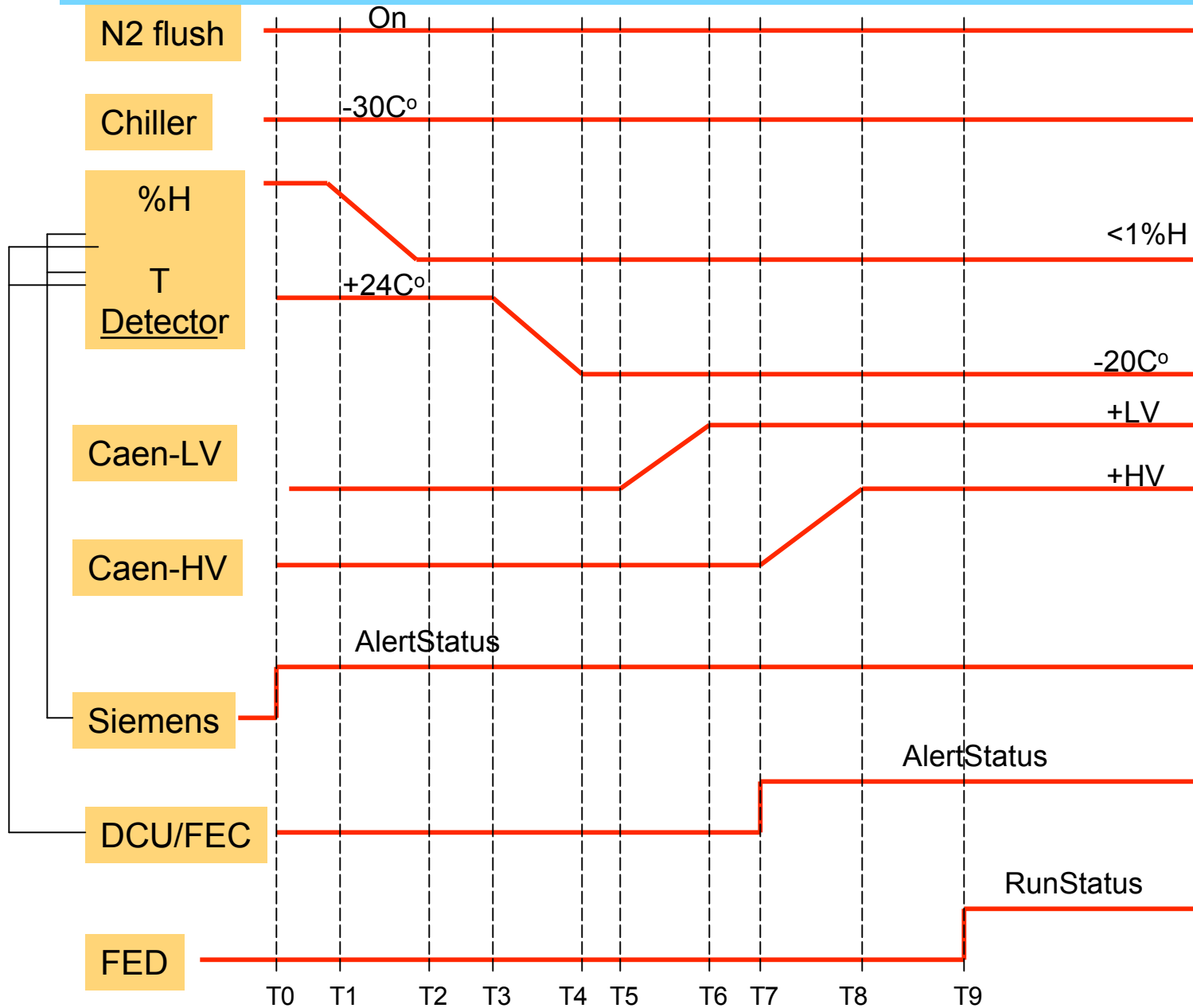
Problem (Global)	Siemens	FEC/DCU	FED	Chiller	GC/MS	
	T / %H	Temp	Temp/Rate	Flow/Wght	$\Delta I$ -Current	%Gas
Si Tracker - Thermal screen Off or Failure	$\Delta T < 2$	$\Delta T < 2$	$\Delta T < 2$	FLOW	$\Delta I$	0
Cooling Plant global failure (stop, major leak)	$\Delta T > 50$	$\Delta T > 50$	$\Delta T > 50$	FLOW	$\Delta I$	0
Major leak in supply lines.	$\Delta T > 50$	$\Delta T > 50$	$\Delta T > 50$	FLOW WGHT	$\Delta I$	0
Minor leak in supply lines.	0	0	0	FLOW	0	0
High radiation level	DOSE	DOSE	0	0	$\Delta I$	0
N2 flow failure (stop flowing, no dry)	0	0	0	0	0	%H2O
Global power cut in the counting room						0
Global power cut in the cavern	$\Delta T$	$\Delta T$	0	0	$\Delta I$	0
Siemens PLC failure	PLC	0	0	0	0	0
Coolant radiation damage or impurity pollution.	$\Delta T$	$\Delta T$	$\Delta T$	FC72	$\Delta I$	0

# Interface to DCS

DCS	SIEMENS T,%H	FEC/DCU T,%H	FED $\delta T$ , Rates	CAEN /	CHILLER Flow/Wght	GAS ANALYSIS
Control Script						
WARM START*	ON-T, %H	ON-T, %H	OFF	OFF	ON-Flow	ON
COLD START	ON-T, %H	ON-T, %H	OFF	OFF	ON-Flow	ON
RUN INIT	ON-T, %H	ON-T, %H	ON	ON - /	ON-Flow	ON
DATA RUN	ON-T, %H	ON-T, %H	ON	ON - /	ON-Flow	ON
CALIB RUN	ON-T, %H	ON-T, %H	ON	ON - /	ON-Flow	ON
END RUN	ON-T, %H	ON-T, %H	ON	ON - /	ON-Flow	ON

- Control Scripts written by software experts.
- Important input from hardware: TB and R&D experience
- Timing Sequence defined for each.

# Interface to DCS ("WarmStart")



# Engineering Tests

