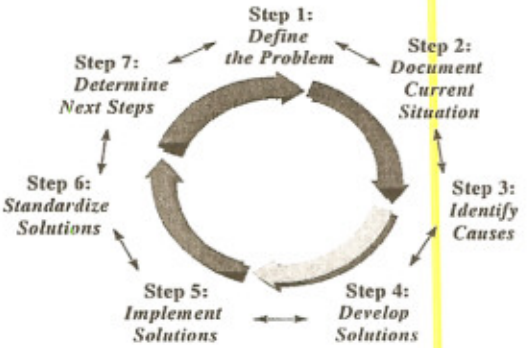
Distributed at Aug 06 mtg.

CS Lessons Learned Template

(Rev. 1)

System: Solvent Exhaust (DURR)
Tool: Various
Process: 8"



Issue Response Team Closure Date: 7/5/06

Lessons Learned Date: 7/5/06

- **Attendees:**

Attendees
New Mexico Facilities Operations Supervisor
New Mexico Facilities Engineering System Owner
Facilities Technician
Facilities Technician
New Mexico Facilities Engineering System Owner
Facilities Technician
Facilities Technician
EHS

- **Problem Statement:**

F11S DURR failed on flame failure at 2:11 7/3/06

- **Timeline of Key Events** (no need to recreate if captured in CS Issue Response Team Template):

WW	Date	Time	Tool(s)/System(s)	Comments / Details
WW 27	7/3	2:11	F11S DURR Solvent Exhaust	Technicians receive alarm of DURR flame failure via internal alarm pager system.
		2:15		Placed system in auto shut down to begin trouble shooting of cause. System went into bypass. No impacts to Manufacturing systems.
		2:30-5:00		Shift 4 technicians' troubleshot system after auto shut down had completed. Suspected the burner flame controls caused the unit to shutdown. Gathered spare relay, signal amplifier card & key pad from GSS Shops Building. Fault code on burner flame controls was Fault #8 Flame AMP/Shutter. This fault lists items to check including replacing the above parts. Also trying to respond to PLC alarms that were being generated for the rest of the site during this time frame.
		5:00		Shift 4 technicians locate and transport DURR parts for replacement to the F11S control room. Recommend that shift 5 replace the relay, signal amplifier & the key pad. Purple Peeper Flame Detectors (PPFD) had been replaced 6/24/06.
		5:30		Facilities Supervisor notified of issue.
		6:00		Passdown with shift 5 techs on issue.
		6:30-12:45		Shift 5 techs performed the following troubleshooting. • Replaced the desorb actuator first thing.- functional

				testing not complete. This was an existing PM and techs took advantage of the downtime to complete this work. • Replaced the burner controller/ relay but could not clear faults on the system to attempt a restart. • Re-installed the original burner controller/relay it worked fine; we then attempted to restart the system. • System would not restart kept failing "Flame detector fault" • Continued troubleshooting the system, seems the purple peepers "may" be the culprit, we are receiving 0 (zero) VAC from the purple peeper back to the HMI and we should be receiving ~2.5Vac to 4Vac. • Re-aligned P/Peepers numerous times in hopes of an easy fix, didn't help. • Checked all fuses in the PLC cabinet and found one bad feeding 24vdc monitor replaced it and moved on.
		12:45		Techs believe problem may be with purple peeper flame detectors. None are found in stock because they had been used on the downtime incurred on 6/23/06. Supplier is contacted for emergency order. Order is placed with Manufacturer.
		13:30		After initial troubleshooting is complete NMFE system owner is contacted. Message left.
		14:15		NMFE owner contacts site and confers with technicians on troubleshooting. Checked gas system valves and they seem to be actuating and feeding gas to the system when required.
		15:00		GISO calls Facilities and informs that parts are being shipped and will arrive at 2-3am on July 4th. Will be delivered to site and shift 4 Tech is the contact.
		16:00		Investigation of the PLC in the control room found a loose wire. This loose wire caused the PLC logic controller to lose communication to the DURR system. System stays in last state and no impacts to the system. I&C is called and a message left for a request for them to come onto site and reprogram the processor to get communication back between the PLC and the DURR. Technicians are repairing the loose wire termination and inspecting all connections.
		16:00		Facilities Supervisor informs Facilities manager of the situation.
		17:00		No reply from message left with I&C. Facilities supervisor's contacts back up I&C engineer. Engineer is making accommodations and contacts to try and get on site to reprogram the processor.
		17:15		Notified by GISO that the order for the peepers was not received early enough for tonight's flight. New expected arrival time on site is 13:15 7/4/06.
		17:25		Processor reinstalled after techs troubleshot.

		18:30		Shift 4 Technicians meet with I&C engineering to replace back plane for power supplies.
		19:15		Engineering starts to reload programming for PLC processor.
		19:30		PLC processor programming completed.
		19:40		Shift 4 technicians start to reset all faults on system for auto restart.
		20:18 thru 21:03		Auto restart command is given several times. Unit faults several times on flame failure. Purple peepers not seeing flame during re-start. Checked all components again & decide to check the igniter transformer due to corrosion on terminal.
		21:15		Supervisor contacted & given update on system.
	7/4/06	01:00		Checked spare parts for new transformer & igniter if needed. Parts are verified to be in stock
		01:15		Igniter transformer terminal cleaned & found connection to be loose. Connection was tightened up.
		01:49		Tried again to restart unit & unit failed again on flame failure. Decided to wait until new Purple Peepers are on site to continue to troubleshooting. Verified that we had spark at the igniter via the view ports on the burner during last restart efforts. Gas valves were also verified to be opening.
		5:00		Supervisor contacts shift 4 techs for an update
		06:00		Passed down findings to Shift 5. Shift 5 techs will check air flows for Oxidizer causing gas not to ignite.
		6:30		Supervisor and techs confer. Plan is to check the air flows and then we will need to wait for the arrival of the purple peepers to install and test.
		7:00		Completed functional testing of newly installed desorb actuator (not part of problem but needed to be done during downtime).
		9:00		Troubleshooting gas/flame to pilot, could not "visually" detect flame through site glass – replaced 120vac pilot solenoid (original solenoid).
		11:00		Attempted restart, same failure zero voltage from flame detectors to burner controller. Decided to wait on Purple Peepers to come in afternoon time frame. Contacted engineering and manager to give update.
		12:00		Discussed problems with Maintenance team – Decided a flame detector adjustment might be the issue.
		1300		We all meet at the unit re-aligned flame detectors verify gas to the pilot attempt a start unit failed same issue.
		1350		Changed out burner controller module, we were unable to reset faults on this module.
		1400		Removed PPFD and installed new ones attempted a start – same fault.
		1550		Verified wire connections in PLC, junction box in gas train, did not find any loose connections. At this point we decide to acquire schematics for system and reconvene in the morning.
		1650		Techs re-verifying connections in the flame detector J-box

				notices the there is no wire on the output Terminal block from the flame detectors back to the PLC – Techs troubleshot wiring in the J-box find a loose wire had landed on the output to the PLC. Techs attempt a re-start detect a flame and voltage ~.8 – 3.5 volts VOC continues with start up process.
		18:00		Pass down information to shift 4 that system is in start up mode.
		18:30		System out of bypass and returned to full abatement. Facilities Manager, EHS, and Manufacturing notified.

- **Root Cause:**

Output wire from the flame detector to the burner controller had a loose connection.

- **Contributing factors/problems:**
  None
- **Fixes:**

All connections in the buss and PLC have been audited and tightened.
Next PM's for F11S- Check connections in the junction box for tightness.

- **Key Learnings (+/-):**

Continuous troubleshooting and not giving up gave results.
Gas trane cabinet high voltage transformer feed to igniter crimp connection was corroded. Techs cleaned up the cable.

- **Follow-up ARs, Owners, ECDs, (Include updates to pertinent roadmaps and communication to JETs etc.):**

AR	Owner	Due Date
Why is the system not going into automatic bypass?	Facilities Engineering	In progress, being reviewed by Instruments and Controls Engineering
Check connections in the junction box for tightness.	Facilities Techs	Complete
Review incident in brown bag training session.	Facilities Engineering	Will be completed by July 18th for front half Technicians and July 20 for back half Technicians
Check other 3 gas trane cabinet high voltage transformer feed to igniter crimp connection for corrosion.	Facilities Techs	Complete