

The Big Chill:

Ensuring Infrastructure Capabilities

Diana de la Rosa
Sandia National Laboratories

The Big Chill of 2011

- What happened
- Time line
- Affects
- Lessons Learned
- One year later
- Progress forward

What happened?

- Extreme cold
- Gas supplies were not delivered in NM
- Wellhead freeze-offs
- Electrical outages in Texas affected natural gas production operations
- 20% deliveries missed
- Interstate pipeline pressures dropped, consequently the local distribution system pressures also dropped
- To avoid catastrophic system failure, service was curtailed to 28,707 customers statewide
- Had supplies ordered been delivered - no service interruptions

What happened?

Federal Energy Regulation Commission and North American Electric Reliability Corporation Report:

“The principal cause of the gas service curtailments experienced in several southwestern states was the production declines in the supply of natural gas, which led to volume and pressure reductions in the pipelines.”

February 1, 2011, Tuesday

28°F

- Just Before Midnight:
 - a period of 88 Consecutive hours of below freezing temperatures (lowest -7° F) begins
 - Facilities working through the early morning hours and all day clearing snow and ice for Wednesday (2/2/11) opening and preparing for severe cold weather
- 2:38 pm
 - Early release and Wednesday Delay Message.

February 2, 2011 Wednesday

9° F

- Facilities working through the early morning hours clearing snow and ice for Wednesday opening.
- Around Noon
 - NM Gas asks SNL\NM to enact voluntary curtailment of gas Thursday morning.
 - PLAN: Place facilities into setback starting at 6 am Thursday
- Approx. 2:30 pm
 - Power Company may request a 4 megawatt hour reduction
 - Facilities readies Power Curtailment Plan

February 2, 2011, Wednesday

9° F (continued)

- 2:51 pm
 - EOC Activated
 - The Gas Company could force reductions
 - Fire Suppression systems are most at risk
 - Primary concern is from 6-10 am Thursday
 - Gas Curtailment is enacted
- 4:44 pm
 - E-mail message to employees explaining building temperature reductions & cold weather instructions.

February 3, 2011, Thursday

18° F

- 6:00 am
 - Heating systems are in set-back mode.
- 7:00 am
 - NM Gas indicates pressure issues still exist so keep our plan in place.
- **7:39 am**
 - **EOC receives call from NM Gas notifying that the gas feed to KAFB and SNL\NM will be shutoff in twenty minutes.**
- 8:23 am
 - Gas pressure went from 18 psig to 0. All gas shut off

February 3, 2011, Thursday

18° F (continued)

- 9:52 am
 - Due to low temps, sprinkler systems shutdown.
- 11:30 am
 - Early release for employees
- 11:41 am
 - KAFB Water Wells are freezing and hydrants have been switched over to city water.

February 3, 2011, Thursday

18° F (continued)

- 12:40 pm
 - Some gas service may be restored to KAFB later in the day.
- 1:21 pm
 - Some gas restored – only low pressure.
- 2:30 pm
 - Decision made to isolate all fire suppression systems.
- 6:10 pm
 - Decision made to close SNL\NM Friday 2/4/11.

February 3, 2011, Thursday

18° F (continued)

- 10:34 pm
 - Temperatures in buildings holding in the 55-60 degree range.
- 11:31 pm
 - Working with gas company to get approval to bring buildings back up to temperature.

Timeline February 4, 2011

34° F

- 7:30 am
 - Update from NM Gas –emergency is over in the Albuquerque Area
- 11:20 am
 - Remaining gas turned back on to Kirtland Air Force Base.
- 2:14 pm
 - SNL preparing to move into the Termination & Recovery phase.
- 3:34 pm
 - SNL Recovery Manager assigned

Timeline February 4, 2011

34° F (continued)

- 6:00 pm
 - Hand off to SNL Recovery Manager

February 2-10, 2011

48-41° F

- Saturday 2/5/11 through Thursday 02/10/11
 - Facilities continues re-lighting more than 160 Boilers
 - Restoring more than 200 Fire Suppression Systems
 - Repairing more than 335 requests for service resulting from freezing
- On Thursday 02/10/11 at 2:24 pm
 - Recovery Manager briefs the Emergency Director (ED) that the goals and criteria established for recovery have been met.
 - The Emergency Director declares the site out of the recovery phase .

Affects at Sandia National Laboratories/NM

- Damages
- Time



Lessons Learned

- Safety of MOW and impacts to community were always considerations in the decision process
- Blackberry invaluable to communicate
- Retirements in 2011 resulted in loss of institutional knowledge
- Notification by gas company to SNL was informal
- Communications to Members of the Workforce (MOW) were both effective and confusing at times
- VPN worked well for telecommuting

Lessons Learned

- Sandia actions minimized damage and time lost and facilitated recovery activities
- Facilities “war room” worked well with EOC
- Facility contact list is vital
- Work from Home was effectively demonstrated

One Year Later

- Infrastructure Department improving curtailment/shutdown plans for Gas and Electric power
- Emergency Management included with curtailment plans
- Cyber security planning
- LDRD project

Progress Forward

- Review Electric, Gas and Water plans
- Determine need for more data
- Ensure emergency management is included in planning and notification processes

Questions?