



1909 K Street, N.W.
Suite 600
Washington, D.C. 20006-1167
P 202.585.6900
F 202.585.6969
www.thompsoncoburn.com

Memorandum

TO: Ellen Ginsberg, General Counsel, Nuclear Energy Institute

FROM: Jeff Craven

DATE: December 20, 2012

RE: Summary of 2012 Survey of Plants Regarding Use of Telex Equipment and Potential Alternatives

At your request, we have reviewed the results of the most recent plant survey undertaken by NEI, in cooperation with UTC. Almost 50% of the plants responded to the 2012 survey.

Consistent with the results of the 2005 and 2008 plant surveys, the 2012 survey reveals that:

- the plants still uniformly rely on Telex equipment to meet their mission-critical communications requirements during outages and all but one also use Telex for non-outages maintenance.
- despite testing 37 potential alternative types of equipment, the plants report that none comes close to providing the level of clear, reliable, durable, hands-free, wireless communication that is critical to reducing plant workers' radiation dose as they perform outage and maintenance operations.
- Plant use of the Telex equipment continues to be intermittent and principally indoors.

Section I, below provides a fuller summary of key findings regarding the plants' current use of Telex. Section II captures quotes from the plants on why they continue to rely on Telex equipment, over all potential alternatives. Section III offers insights that the plants shared about the "problems" and "issues" they encountered when testing potential alternatives to Telex equipment. (Please note, not all plants answered every question and, as such, the totals vary in the summary below.

I. 2012 Survey Summary

- 49/104 plants responded.
- 49/49 report that the unique qualities and feature of the Telex equipment are still needed to support their mission-critical communications requirements and thereby promote health and safety.
- 49/49 report that they use Telex during outages, which occur once every 18- 24 months months and last, generally, 37 – 45 days.
- 49/49 report they use Telex “continuously” during outages.
- 48/49 report using Telex for non-outage maintenance functions.
- During non-outages (principally for maintenance in radioactive areas inside the plants):
 - 22 plants use Telex daily.
 - 12 plants use Telex weekly or monthly.
 - 8 Plants use Telex occasionally.
 - 4 Plants use Telex infrequently.
- Plants reported using an average of 16 base stations; ranging from Telex BTR 300s, 700s and 800s, all the way up to the most recently released Telex 80N version.
- On average, the plants use 66 belt-packs (including spares).
- On average the plants require 19 channels to operate during outages.
- On average the plants require 4 channels for non-outage operations.
- When asked if they could “make-do” with fewer channels during outages, 8 said yes, 2 said possibly; and 35 said no.
- When asked if they could “make-do” with fewer channels during *non*-outages, 16 said yes; 4 said possibly; 23 said no, and 2 did not know.
- In the past two years, 18 plants bought the new Telex BTR 80N and TR 80N equipment that operates on just 6 megahertz channels, instead of the 18 megahertz channels required by all other Telex BTR equipment. (Most of the plants report that this improved efficiency does not have a materially adverse impact on the audio quality.)

- 22 plants report that they expect their need for and use of Telex equipment to *increase* over the next 10 years; 27 report that they expect it to remain the same.
- 22 plants indicate that outdoor use, limited for fuel handling, would satisfy their current needs for sensitive outdoor communications; 16 would want more flexibility to address communications gaps, e.g. for using cranes anywhere inside the plants' perimeter security fence area; for the operation of heavy equipment in the plants' switchyard; 2 indicated that it would probably suffice and 5 said that they do not use Telex outdoors.
- On average, the plants' requirements for channels for outdoor use of the Telex equipment is roughly one-third of the number of channels they require for indoor operations.

II. Why Plants Continue to Rely on Telex Equipment

Since the 2005 survey, the plants have consistently reported that the Telex equipment is their first choice for reliable, durable, hands-free wireless communications because it protects workers from excessive dose exposure and promotes safe plant operations generally, principally due to its non-interfering location in the spectrum band, but also because of its design, durability, performance and reliability. In the 2012 survey, the plants shared the following thoughts on why they continue to rely on Telex:

- Four reasons why we use Telex: Durability; Telex has it. Second, ease of integration with other systems. This is growing in importance, as it sometimes is useful to have more than four belt packs on a channel. Third is consistency of use; having all of our communications equipment under one vendor makes training and qualification easier. Fourth is lack of interference with other systems.
- We obtained a Telex BTR-300 which was superb in ease of use, coverage area, quality communication and ease of setup hardwired to an Alpha communications system. There is no other system on the market which can duplicate each of the assets of Telex system. We are currently using Telex BTR-700 in most all areas of containment supported with a fiber infrastructure. We have worked with our colleagues in investigating every possible option and combination of communication systems available on the market and feel there is no comparable product to Telex.
- Most important features are reliability, clarity of communications, versatility interfacing with plant intranet; coverage in areas with numerous obstruction; saves times and dose.
- We value the fact that Telex is highly reliable; does not interfere with other wireless equipment; is hands free; full duplex; and offers ease of integration with other communication equipment.
- Telex offers hands-free operation; high fidelity/audio clarity; avoidance of inadvertent actuation, (e.g., lower power: noted keyed); full duplex; and contributes to ALARA.
- Telex is better in the fact that more people can communicate at one time easily.

- Key telex features for us are hands-free operation; full duplex; contributes to ALARA; Multiuser (48 simultaneous users in our containment enclosure); wireless; ease/simplicity for use for the end user.
- There are some locations and uses where nothing but Telex works to help us reduce dose.
- Telex is used on the Refuel Floor to help coordinate Radiation Protection ("RP") support and lowers RP dose while performing surveys. Telex is also used to allow RP to communicate with reactor Services about critical activities to better coordinate upcoming support. It is used to help communicate changing radiological conditions. Telex is also used in the Drywell to coordinate RP support activities, communicate radiological conditions to workers (dose rate filed worker is in accumulated dose for worker).
- We value telex because it is highly reliable; does not interfere with other wireless equipment, is hands free, and full duplex. We also like that fact that it offers ease of integration with other communication equipment.

III. Issues/Problems with Potential "Alternative" Equipment

In the past surveys, the plants have identified substantial issues with other equipment that they tested as possible replacements for Telex. The 2005 and 2008 surveys indicated that the other systems:

- Triggered unacceptable interference with other wireless devices essential to plant operations (e.g. dosimeters) and wireless networks;
- Created "multi-path" interference resulting from a "reflected signal" because the containment buildings domed ceiling subtracts signal strength rendering it too low/weak to receive;
- Failed to provide adequate coverage "footprint";
- Provided unacceptable voice quality/failed to block background noise; and
- Offered insufficient capacity for multiple headsets/belt-packs in simultaneous use.

Specific issues raised in the 2012 Survey include the following quotes. The names of the equipment manufacturers have been removed in order to avoid any potential claims of commercial disparagement, but are available to the Commission upon request.

- 900 MHz spread spectrum equipment works ok when it is not broken. Durability is an issue.
- Telex indoors is unmatched as compared to 2400 MHz frequency. In a pressurized water reactor, the containment dome characteristics prevent the use of 2400 MHz systems.

- Walkie-talkie and similar two-way radios failed to provide adequate coverage.
- VOIP Communications over WIFI did not match Telex in audio clarity and, even though we liked the software/hardware package, it is limited by the strength of your WIFI backbone and a strong WIFI backbone is difficult in an industrial environment.
- 2.4 GHz equipment has background noise which is a problem; this equipment isn't durable; transmission drops often. Also, it is not moisture resistant.
- 1.9 GHz wireless intercom systems were not durable and required CAT-6 cable needs to be run to connect base to antennas. This can be limitation if used in Containment due to the increased dose that could be received running the cables.
- We have struggled with ineffective outage communications for many years. Our initial attempt was a 900 MHz spread spectrum product which initially fared well but antenna and micro switches failed in time. More recent versions had minimal payback as the system would not integrate. The quality of the audio was low, and dropped transmissions still occur. Next attempt was dependent on in-house phone system and cell phone units, which failed due to harsh environments with micro connectors. As a result, we have stayed with Telex.
- 2.4 GHz equipment does not work in round buildings. It is cheaply constructed-and not durable. Controls are hard to operate because C-zone-buttons did not protrude. Hard to operate by end user. Rejected for site communications.
- We purchased a 900 MHz spread spectrum for use and deployed it three years ago. We experienced significant interference with the remote electronic dosimetry monitoring system that uses 900 MHZ spread spectrum. Secondary problem was durability; belt-packs broke and had parts drop off. This is a major issue for nuclear plants where foreign material avoidance is a high priority.