

# BACKGROUND, CURRENT DATA & JUSTIFICATION FOR WAIVER OF FCC'S RULES TO ALLOW CONTINUED USE OF TELEX EQUIPMENT AT U.S. NUCLEAR POWER PLANTS

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# Telex Equipment

- Wireless intercom systems offer reliable, high-performance, fully duplex, hands-free communications
- Frequency-agile base stations work (line-of-sight, 1,000 feet) with frequency agile backpacks
- Belt-packs come in sturdy (shock resistant die cast magnesium) casings and feature 12-14 hour battery life
- Many plants use BTR 700, 800 operating at 470-608MHz, 518-608MHz, 614-740MHz, 796-868MHz
- Power requirements: 100-740 VAC, 50-60Hz, IEC receptacle
- Frequency response: 300Hz – 8kHz
- Transmitter power: 50 mW - 100 mW Max (high); 5 mW - 10 mW (normal)
- Transmitter Modulation type: FM
- Transmitter Deviation: 40kHz
- Transmitter RF Frequency stability: 0.005%
- Receiver distortion: <1% at full deviation
- More data available at [www.telexradiocom.com](http://www.telexradiocom.com)

# Regulatory Background

- April 2003 -- FCC approves use of Telex equipment at nuclear plants via Special Temporary Authorization ("STA").
- April 2005 -- FCC issues STA to Nuclear Energy Institute ("NEI") for use of Telex equipment at the nuclear plants.
- April 2007 -- NAB, MSTV, SBE, NEI and Utilities Telecom Council ("UTC") file an agreement (the "Consensus Plan") with FCC to allow nuclear plants to continue to use Telex equipment pursuant to FCC-granted experimental licenses.
- Summer 2007 -- FCC and NTIA approve experimental licenses for nuclear plants to continue to use Telex equipment.
- February 2008 -- Nuclear plants, NEI and UTC file reports with FCC confirming no alternative equipment is available to meet nuclear plants' communications and safety requirements presently served by Telex equipment.
- Summer 2008 -- Nuclear plants, NEI and UTC sponsor survey of industry use of Telex equipment and alternative equipment, as well as engineering studies of certain alternative equipment, and submit data to FCC's office of Engineering & Technology.
- Winter 2008/2009 – Nuclear plants apply for and receive 12 month renewals (until 2/19/2010) of their experimental licenses.

# 2008 Survey Data

- Nuclear plants continue to rely on Telex equipment to carry on critical, operational and outage-related activities while effectively limiting worker occupational exposure to radiation
- Most nuclear plants are using Telex BTR 200, 700 or 800
  - Operation on frequencies associated with TV channel 52 and above limited to 700 and 800 series
- 75% of the nuclear plants limit Telex equipment use to indoor activities
- 50% of the nuclear plants use Telex equipment only during refueling operations (“outages”)
  - 25% use it two to three times per month; 10% use it weekly
- Most nuclear plants support the issuance of a blanket waiver limited to indoor use if it will expedite FCC approval of the waiver

# Alternatives Tested

- Nuclear plant licensees have significantly increased their efforts to seek alternatives to the Telex equipment
- 11 nuclear plants tested the following potential alternative equipment in 2008:
  - Cobalt;
  - HME DX200;
  - Spectralink;
  - Eartec Communications Systems; and
  - ClearCom Communications' CellCom 10 Digital Wireless System.
- The alternatives tested each suffered from one or more of the following deficiencies:
  - Triggered unacceptable interference with other wireless devices essential to Nuclear plant operations (e.g., dosimeters) and wireless networks;
  - "Multi-path" interference resulting from a "reflected signal" from the containment building's domed ceiling subtracts signal strength rendering it too low/weak to receive.
  - Inadequate coverage/footprint;
  - Unacceptable voice quality; and
  - Insufficient capacity for multiple headsets in simultaneous use.

# Operational Conclusions

- Given their unique operating environment (e.g., four foot thick outer walls, containment building's domed ceiling; dosimeters, as well as numerous other wireless devices and equipment/systems, that must operate simultaneously, reliably and in very close proximity) nuclear plants present an ultra-challenging wireless communications environment.
- None of the alternative equipment tested demonstrated anything close to the same functional capability required in this ultra-challenging indoor environment.
- Nuclear industry workers continue to need fully functional communications equipment to perform indoor activities in "hot" areas during outages; for moving spent fuel indoors; and for indoor maintenance functions, including handling radioactive waste.
- For coverage, clarity, capacity and reliability, Telex equipment remains the only option for the described aspects of the nuclear industry's functional communications requirements.

# Waiver of FCC Rules Requested

- NEI, on behalf of the commercial nuclear industry:
  - Seeks a blanket waiver of the applicable FCC Rules in order to enable the nuclear plants to continue to use the Telex equipment in the VHF and 700 MHz spectrum bands for indoor operations only.
  - Eligibility limited to persons primarily engaged in the generation, transmission, or distribution of electrical energy for use by the general public, and use restricted to indoor locations at nuclear power plants.
- Nuclear plants' use of the Telex equipment meets both sets of FCC criteria for granting waivers as:
  - (i) the underlying purpose of the rule(s) would not be served by application to the instant case, and the grant of the waiver would be **in the public interest**; or
  - (ii) in view of the **unique factual circumstances**, application of the rule(s) would be inequitable, unduly burdensome and contrary to the public interest and the applicant has no reasonable alternative.



# Requested Relief Meets FCC's Waiver Standard

- **Grant is in the public interest:**
  - Safety and health of nuclear plant workers is advanced materially by use of the Telex equipment because it reduces worker exposure to radiation
  - Use of the Telex equipment conforms with Nuclear Energy Commission's "ALARA" standard which requires plant to maintain exposures to radiation as far below the NRC-established dose limits as is practical...
  - Blanket waiver promotes efficient use of the FCC's available spectrum
  - 6 years of use of indoor and outdoor use with ZERO reports of interference (or even complaints) demonstrates that the nuclear plants' use of the Telex equipment does not interfere with any FCC licensee or other entity
- **Unique factual circumstances** compel grant of the Waiver:
  - Protection of worker public health and safety in the indoor nuclear plant environment requires the use of communications equipment with functionality standards exhibited only by Telex
  - INDOORS ONLY USE, together with the fortress-like construction of the plants, makes virtually impossible interference with other FCC licenses
  - Plants have tested a dozen alternatives; none compares with Telex equipment in mastering the challenges of communicating inside the nuclear plant buildings
  - Plants have no technology alternative for indoor use that will meet the NEC's ALARA requirements