U. S. LORAN Modernization

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Introduction

- Legacy Loran Today
- Loran Modernization – Achievements
  - Differential Loran
  - Loran Data Channel
  - Lorsta Electronics Recapitalization
  - Control Station Electronics Recapitalization
- Loran Modernization – Expectations
  - Electronics Recapitalization completed
  - Time of Transmission (TOT) Control
  - Enhanced Loran in CONUS and Alaska

Worldwide Loran & Chayka Coverage

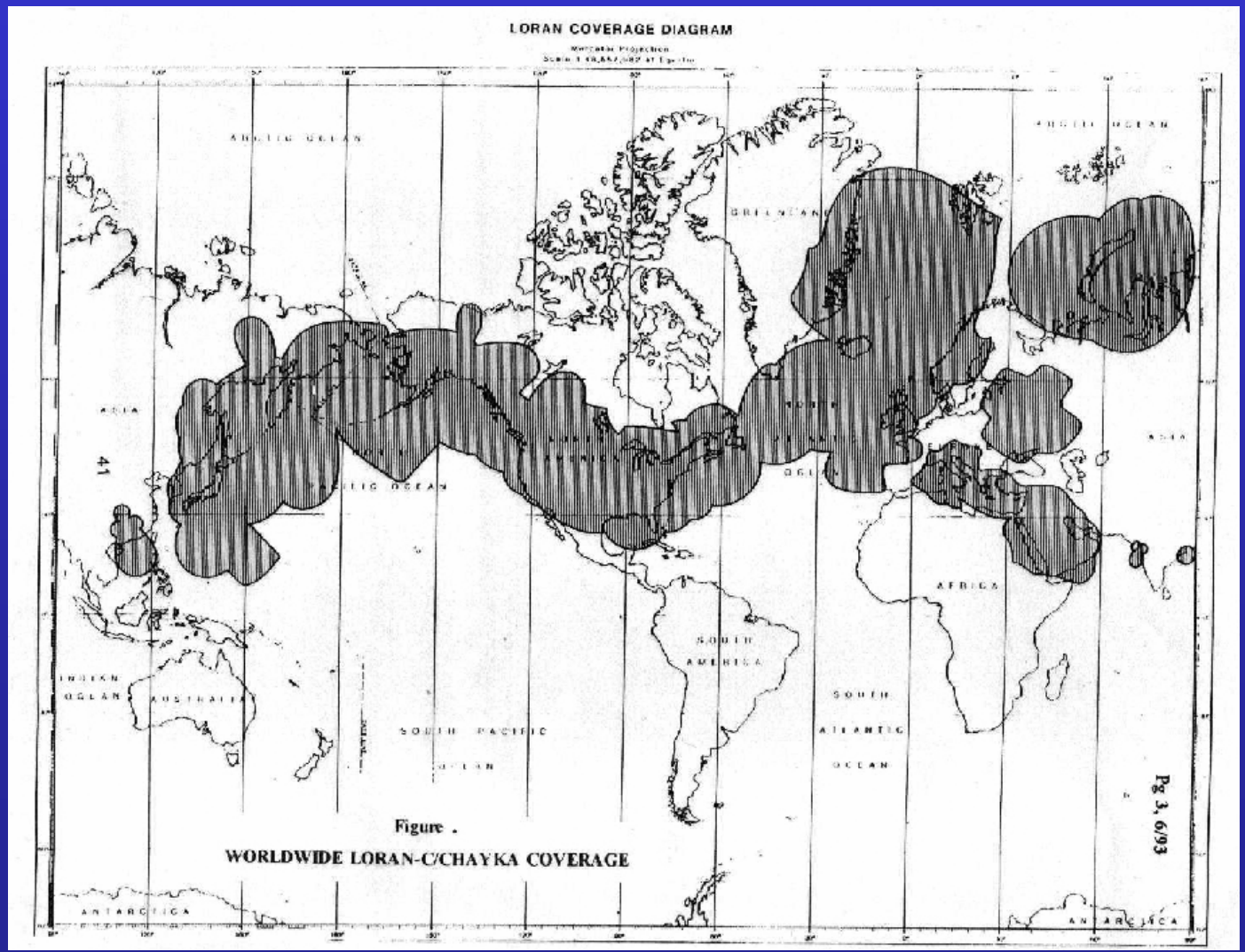
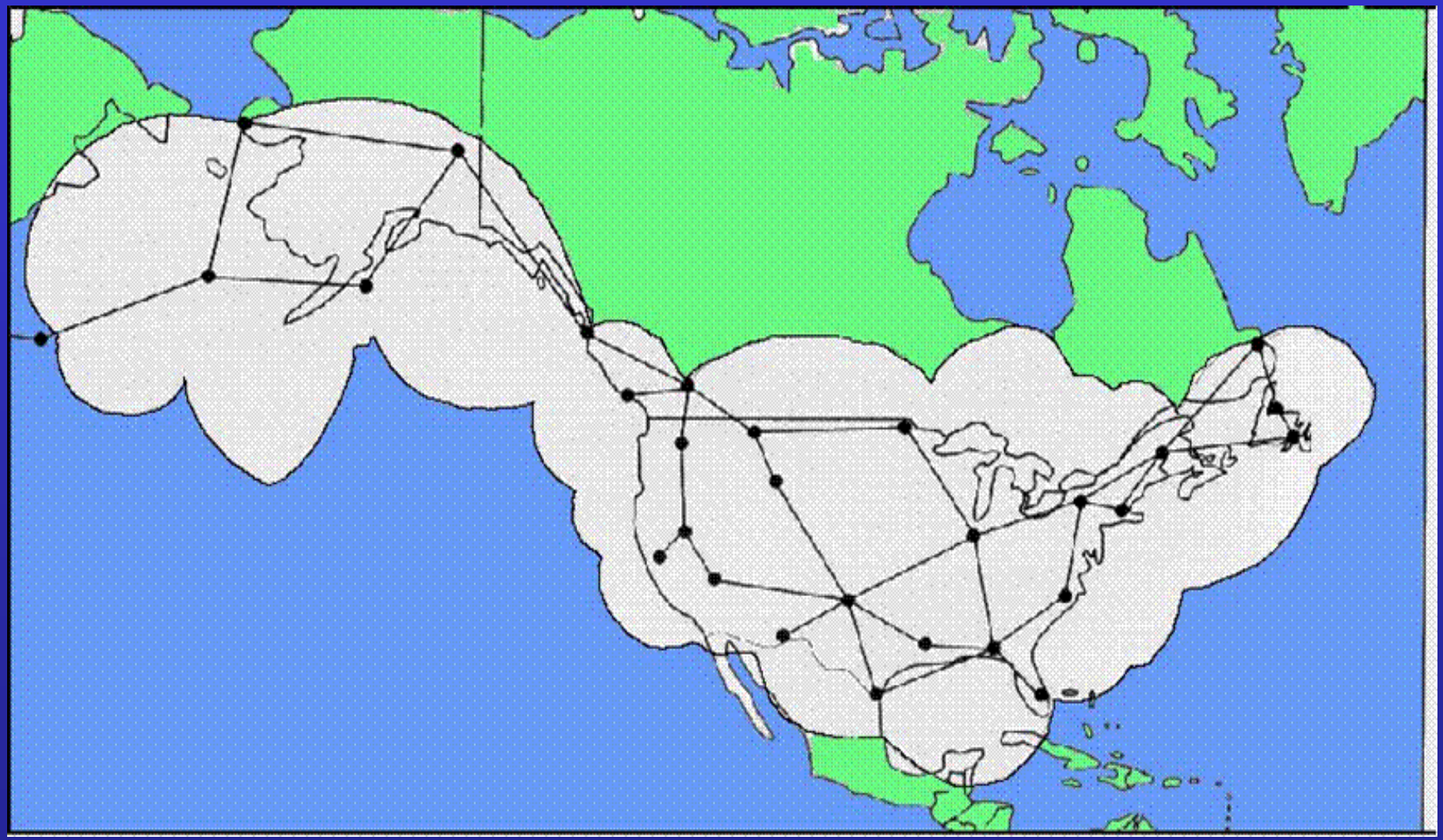


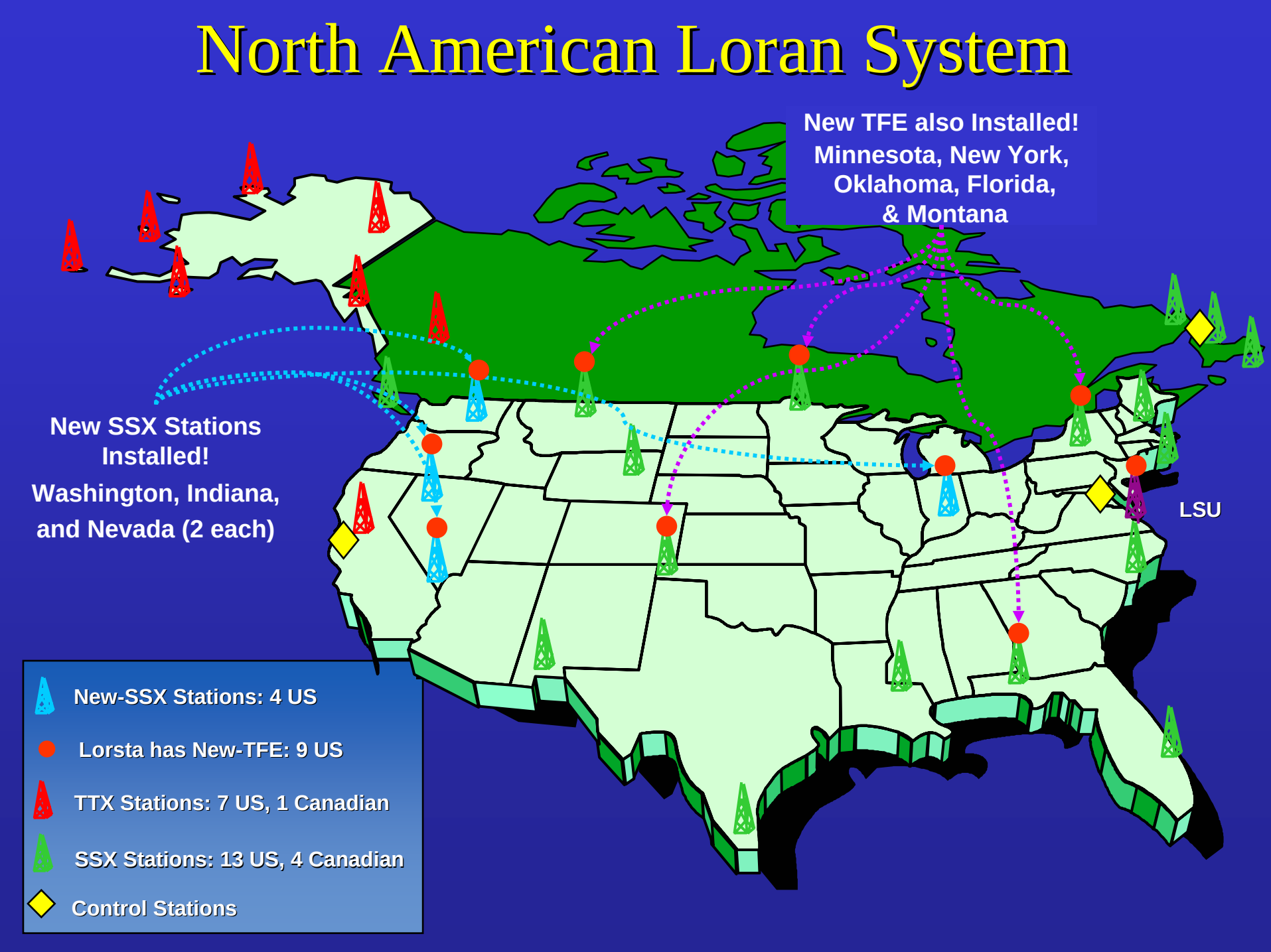
Figure .

WORLDWIDE LORAN-C/CHAYKA COVERAGE

Today's Coverage in North America



North American Loran System



New Loran-Station Electronics

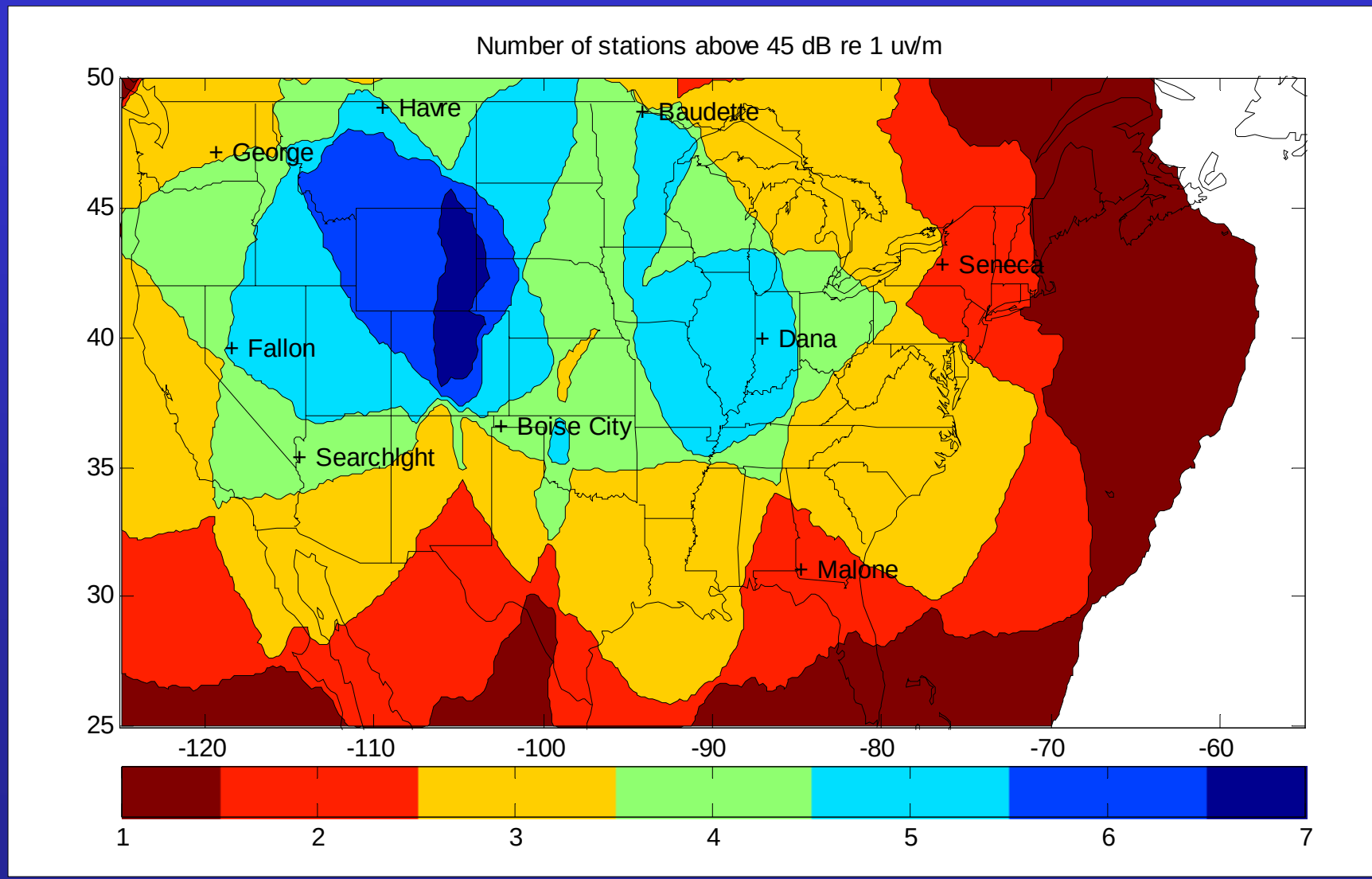
New Solid State Transmitter (NSSX)

New Timing & Frequency Equipment (NTFE)

New Control-Station Electronics

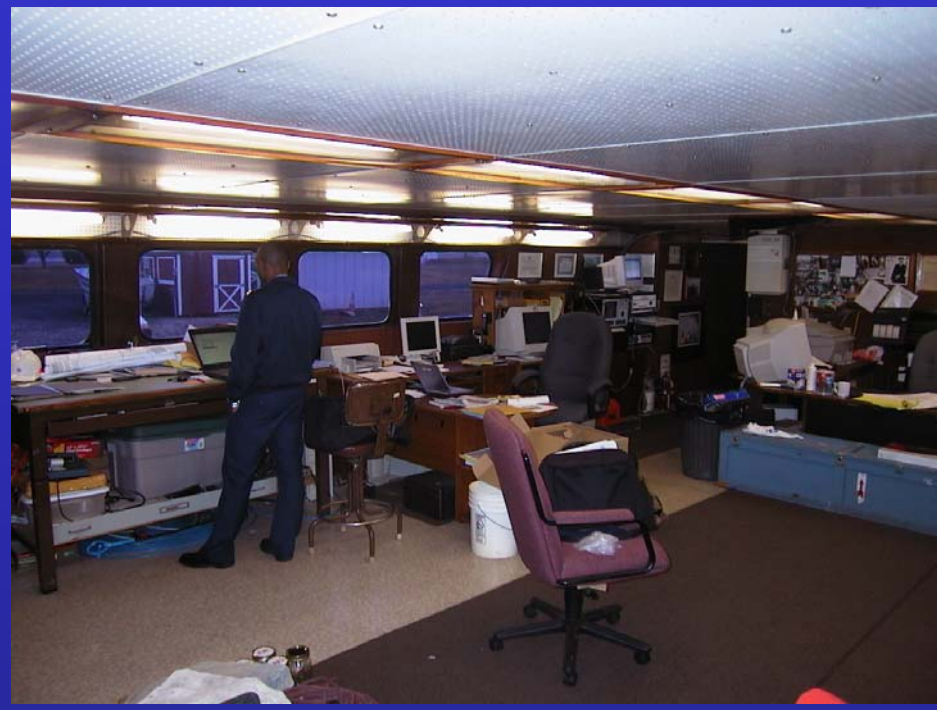
New Loran Consolidated Control System (NLCCS)

Modernized Coverage Today



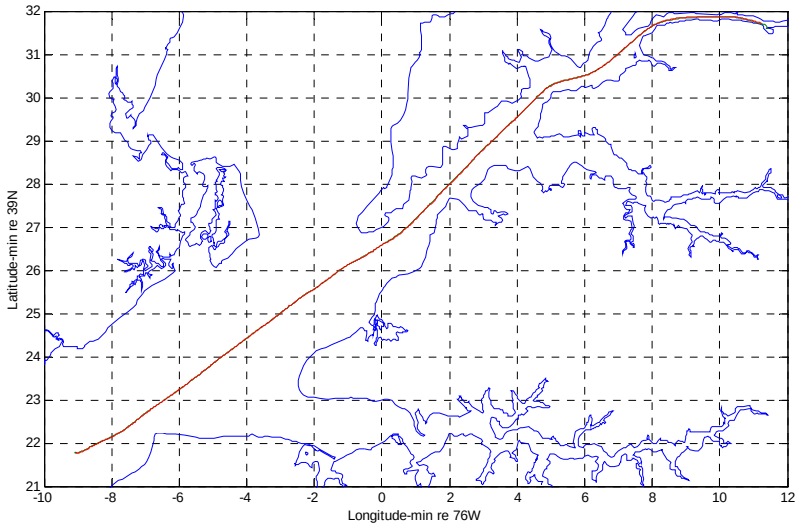
Differential Loran – Real World

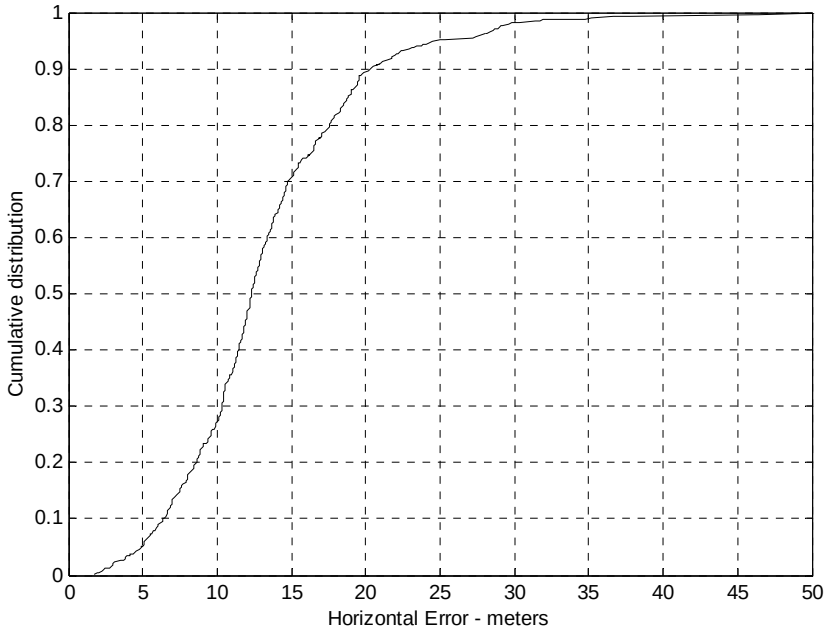
Maritime Environment



Shipboard Installation

Differential Loran – Real Time





Vessel's Track Line

Accuracies Achieved

Loran Data Channel

- Information modulated on a 9th Pulse
- Preserves navigation information on pulses 1-8
- Feasibility proven with solid-state transmitters
- Successful broadcast & reception proven
- Plans to install at Lorsta Seneca, NY
- Differential corrections from several monitors

Time of Transmission (TOT) Control

- By December 2005, in CONUS:
  - Lorsta & Consta electronics recapitalized
  - Loran on TOT control (6 chains)
- By December 2006, in Alaska:
  - Lorsta operations rooms modernized
  - Loran on TOT control (2 chains)
- TOT Control Enables
  - All-in-view receiver development
  - Individualized Differential Loran

"Enhanced LORAN"

- "Enhanced Loran" means Loran is ready to act as a GPS backup.
- Requirements must be met for:
  - Maritime Harbor Entrance & Approach (HEA)
    - Accuracy within 20 meters
  - Aviation Non-Precision Approach (NPA)
    - Integrity of 99.99999%
  - Timing – within 100 nanoseconds of UTC
- Enhanced Loran availability:
  - CONUS by December 31, 2008
  - Alaska by December 31, 2009

Summary

- Achievements
  - New Solid State Transmitters at 4 Lorstas
  - New Timing & Frequency Equipment at 9 Lorstas
  - The Great Lakes Chain is modernized & TOT enabled
  - All 6 CONUS Master stations are modernized
  - The New Loran Consolidated Control System is ready
  - Differential Loran & 9th Pulse have been proven in real time
- Expectations
  - CONUS recapitalization & TOT control by Dec 2005
  - Enhanced Loran in CONUS (2008) and Alaska (2009)

Questions?

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