

# Seismic Program at Boeing



# Agenda

- **What is the need for seismic mitigation**
- **Why the decision was made to proceed**
- **Types of methods used for mitigation**
- **What kind of hurdles we had to overcome**
- **How we Integrated into installation process**
- **Review aftermath of quake (Photos of Feb. 28<sup>th</sup> 2001)**

# What is the need for seismic mitigation

- We are located in a seismic zone 4 region
- To protect physically shrinking computing assets (With greater impact to company business)\*
- Keep the host systems running after an event
  - World Wide Operations
    - Airplane On Ground/Spares Systems
    - Finance Systems
    - People Systems
    - Manufacturing
    - Engineering systems
    - Military/Space & Communication
- Consolidation of computing assets
- Safety of Data Center staff

# Why the decision was made to proceed

- Company critically dependent on computing
- Protect computing investments (self insured)
- Likelihood of major seismic event in region

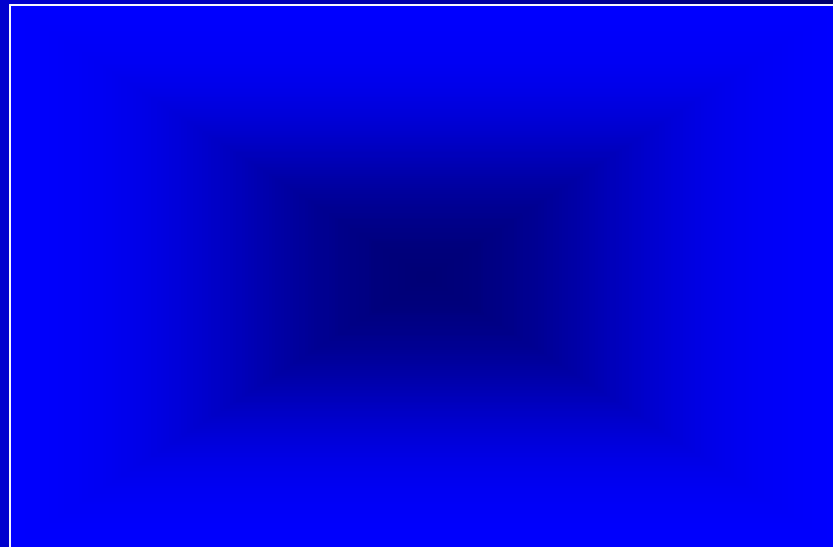
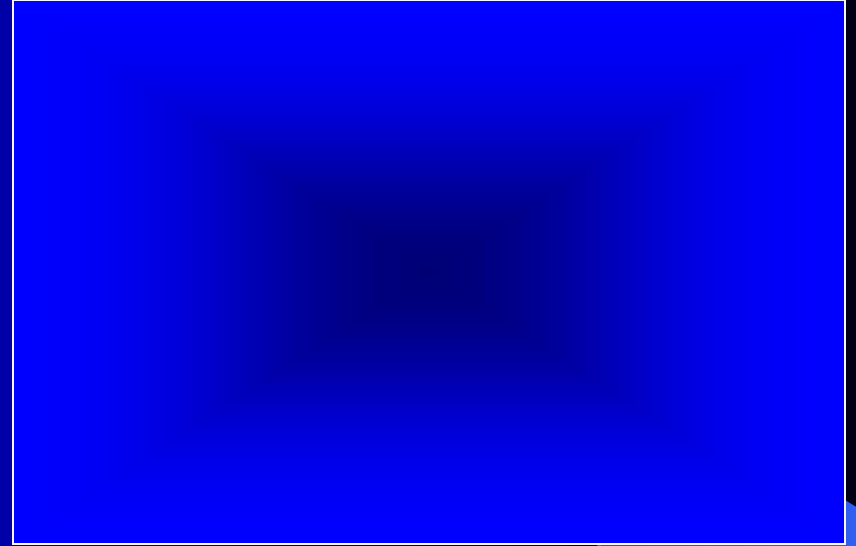
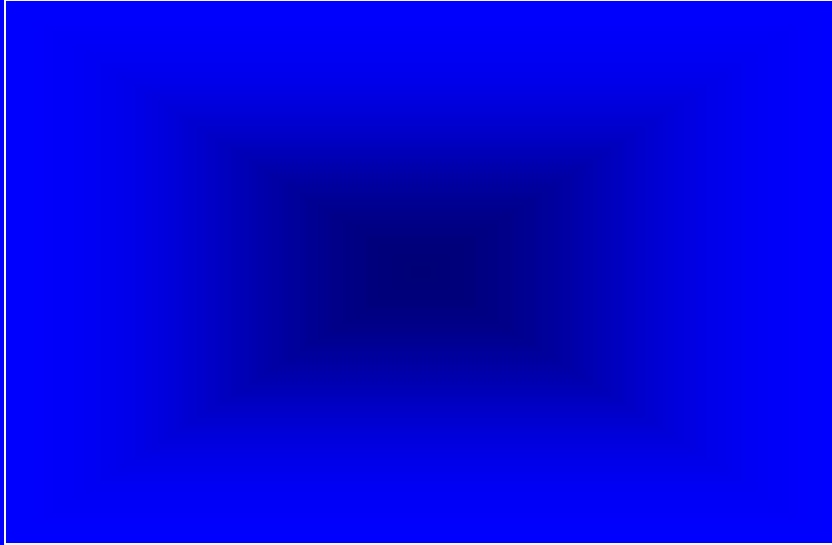
# Types of methods used for mitigation

- **Initially There was fixed bracing for enclosures and free standing racks.**
- **Equipment on racks are strapped down.**
- **Base isolations Platforms.**

# What kind of hurdles there were to overcome

- **Sell senior management on platform option**
  - **Demonstrate platform concept and operation to get Cost vs. benefit agreement**
  - **Gave numerous pitches to different levels of senior management**
- **Acquire funding for project (approx. 1.8M)**
- ❖ **How to get existing equipment onto platforms without scheduling major computing outages**
- **Scheduling and customer confidence to perform activity**

# How to integrate into installation process



# Part of an ongoing integrated process (cont.)

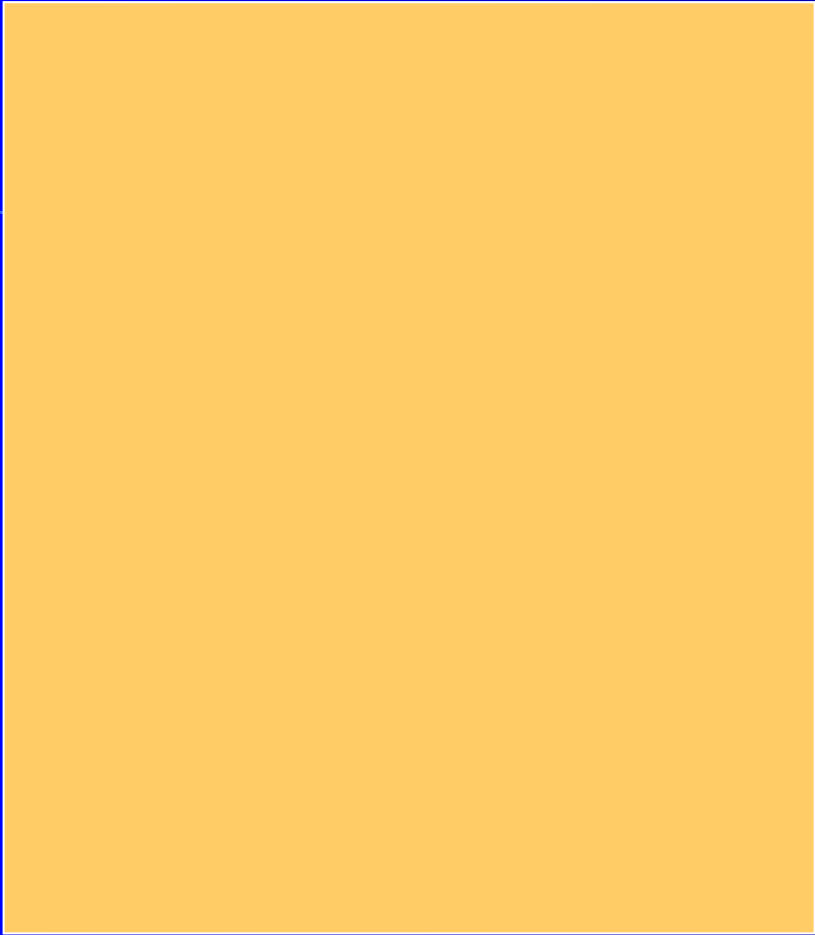
To Date we have implemented seismic mitigation  
On approximately 4400 devices(86%)

- 3500 have been braced or strapped
- 700 devices have been rolled on to platforms during installation
- 183 have been lifted in place while equipment remained online
- 414 Are planned to be seismically mitigated by year end 2002

# After an Actual Quake

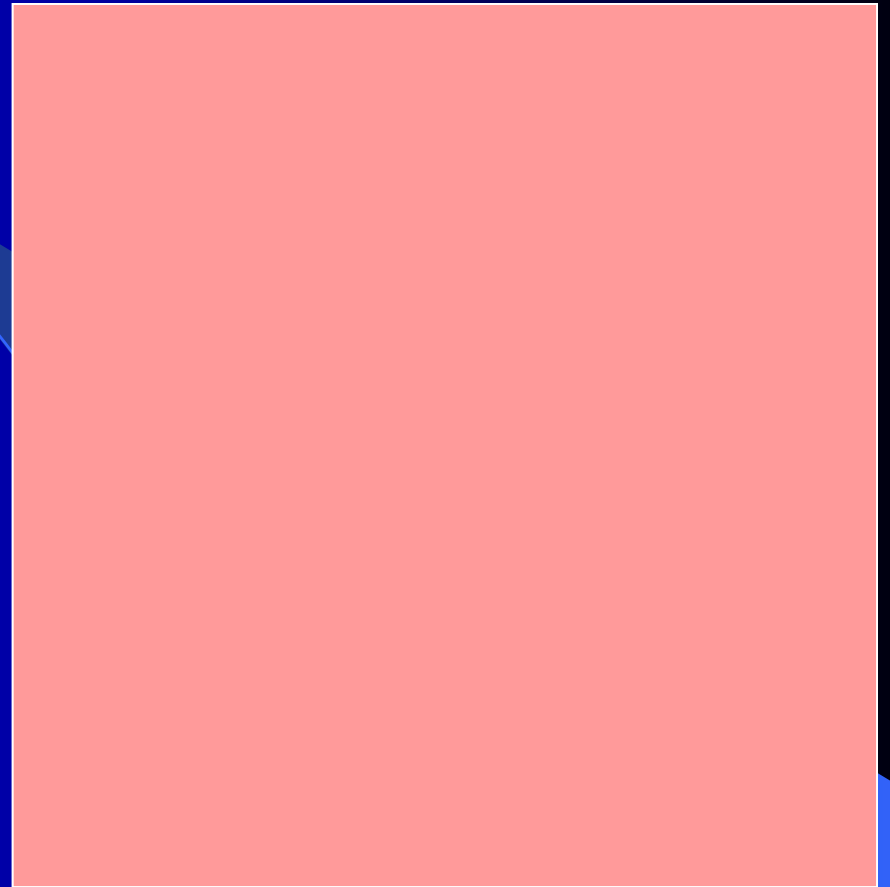
February 28, 2001





**Hundreds of devices**

**Of different shapes and sizes**



**Lift them**

**Online & in place**

**Without service interruption**

# Natural Disaster Risk Profile

# Map of Puget Sound Area