

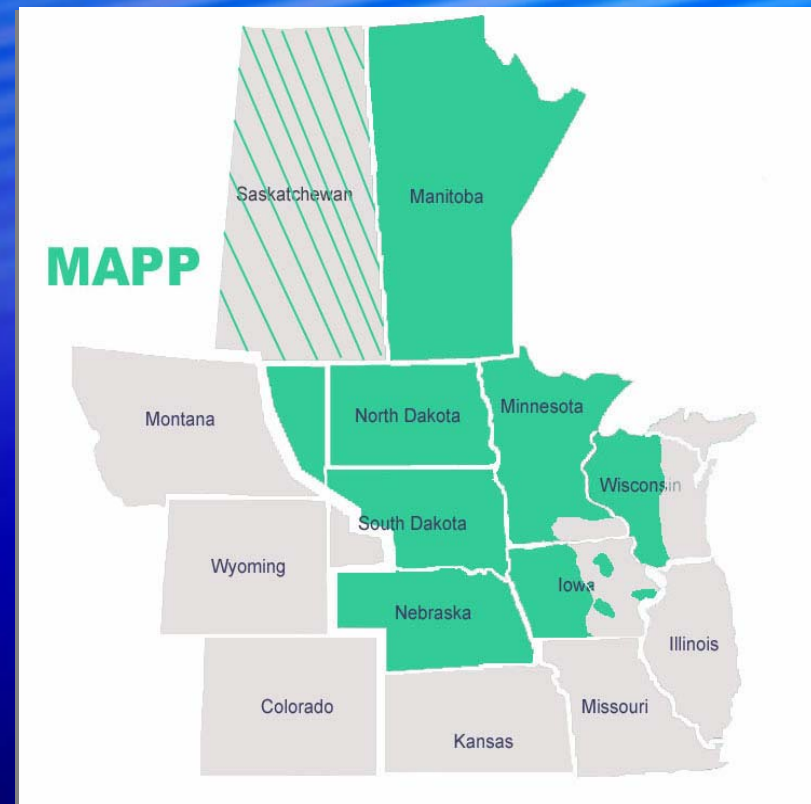
# **CEA Reliability Workshop Cross-Border Transmission Grid Studies - MAPP Region**

**Washington, DC  
October 20, 2004**

presented by  
**R.W. Mazur P.Eng.  
Manitoba Hydro**

# MAPP Region Cross-Border Studies

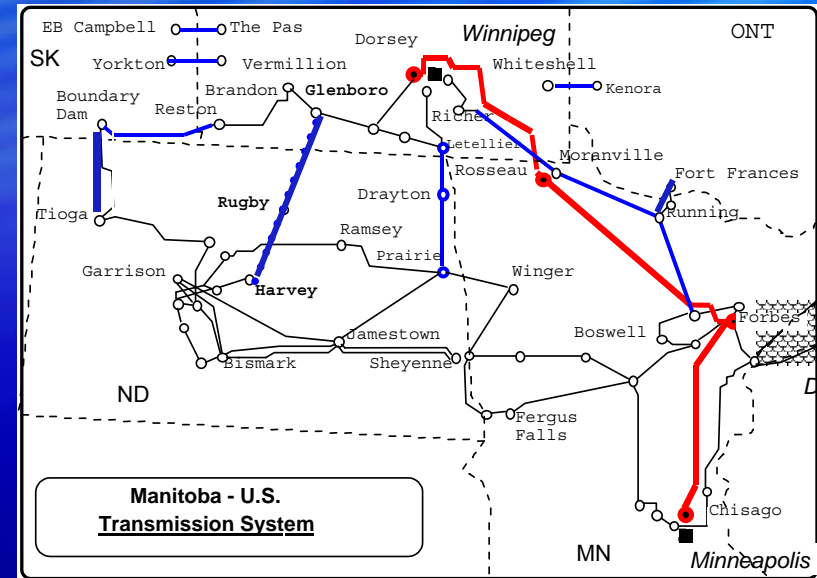
- Were undertaken historically in the MAPP Region by utilities desiring to build interconnections or enter into power purchase agreements
- Transmission costs were bundled into the power purchase agreement
- Existing ties were built under a vertically integrated system.



# MAPP Region

## Cross-Border Interconnections

- Saskatchewan-US line
  - 1 - 230 kV
  - +/-150 MW
- Manitoba - US lines
  - 3 - 230 kV & 1 500 kV
  - +2175 MW / -700 MW
- Ontario - US line
  - 1 - 115 kV
  - +150MW / -100 MW



# MAPP Region Formal Planning Mandate

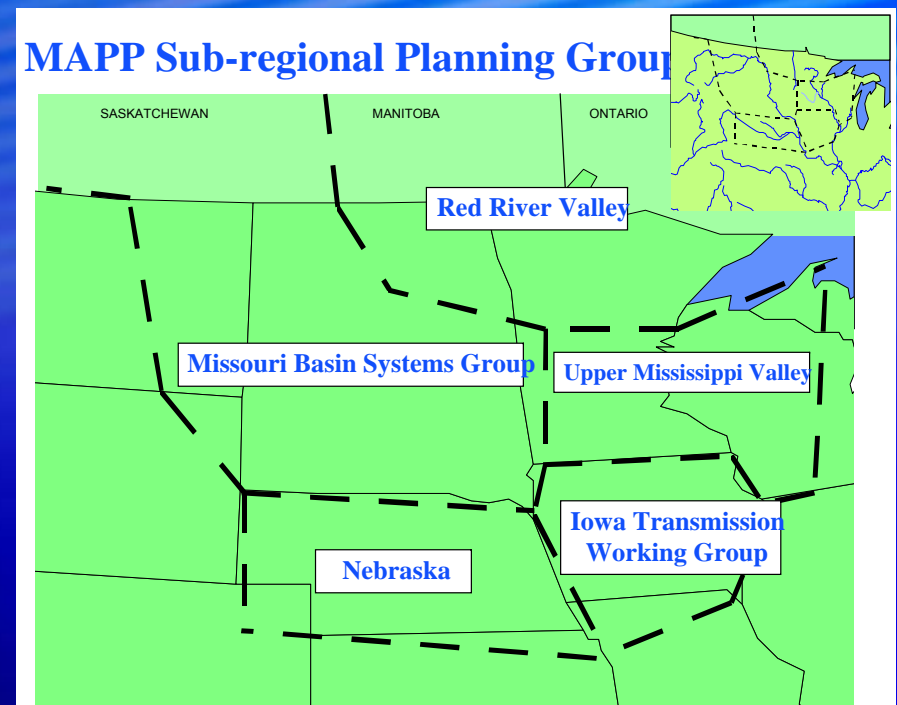
- MAPP Restated Agreement
  - Nov 1, 1996
  - Regional Transmission Committee formed
- RTC required to develop:
  - coordinated regional transmission plan
    - for transmission facilities  $\geq 115$  kV
    - for ensuing 10 years
    - not less often than biennially
- First MAPP ten-year Regional plan
  - Issued in November 1998

# MAPP Planning Process

- Transmission Planning Subcommittee
  - Established in fall 1997
  - Bottom-up, top-down process
  - Sub-regional planning groups formed to provide MAPP Member input
  - TPSC assesses adequacy of Member Plans and identifies regional issues
  - MAPP Design Review Subcommittee
    - Assess project compliance to planning standards

# MAPP Planning Process

- Transmission Planning Subcommittee
  - Established in fall 1997
  - Five sub-regional planning groups formed
  - **Manitoba Hydro participates in the Red River Valley SPG & TPSC**



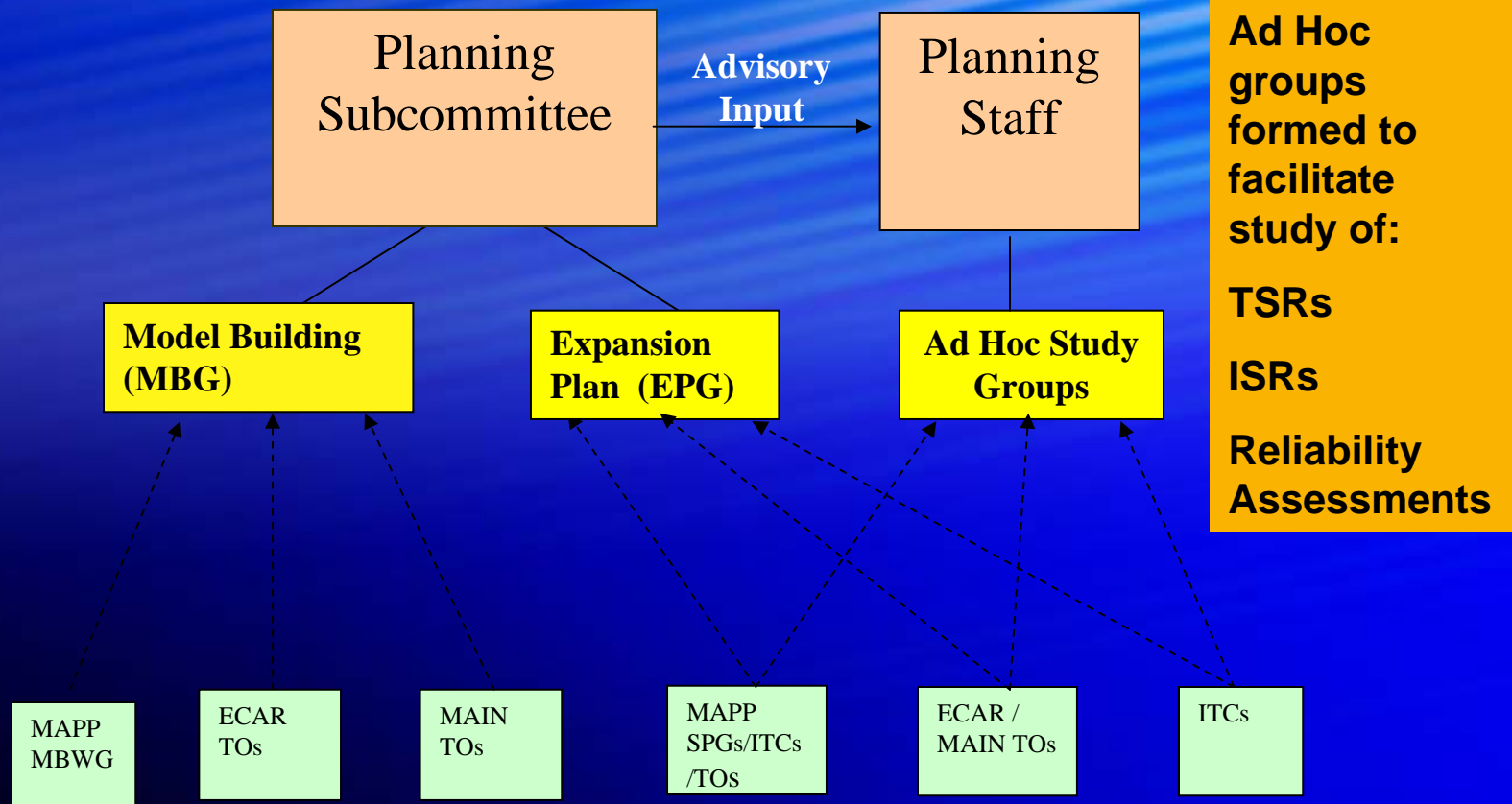
# MISO Planning Structure



Technical Input  
& Support for  
Planning  
Activities

Input &  
Guidance on  
Expansion Plan  
Development

# MISO Planning Structure



# MISO Planning Process

- Similar to the MAPP Planning Process
  - Roll-up of local Transmission owner plans
  - Review TO Plans / Needs / Alternatives
- Conduct Independent Baseline Reliability Study
  - Assess adequacy of TO plans to meet reliability criteria (serve load & firm transmission service)
  - Identify mitigation plans where criteria violations are found
  - MH coordinates plans with MISO

# Regional Planning Process

- **To Date, projects under construction that are identified in regional plans are:**
  - **reliability upgrades identified by the transmission owners**
  - **IPLs or interstate projects brought forth by TOs willing to invest**
    - **Glenboro-Rugby-Harvey 230 kV line**
    - **Arrowhead-Weston 345 kV line**
- **No projects mandated by the MAPP or MISO regional planning process**



# Regional Transmission Studies

- Cross-Border issues addressed in:
  - Seasonal reliability assessments
  - Long-term reliability assessments
  - MAPP/MISO voltage stability study
  - MISO system damping study
  - MAPP/MISO regional expansion planning studies



# Transmission Construction Issues

- Regulatory: multi-jurisdictional
  - Environmental Assessment and regulatory process can take years
  - Face the same permitting issues as internal state, interstate or provincial inter-provincial lines
    - State or provincial license required
  - **Additionally, Canadian and US federal permits are required**

# Transmission Construction Issues

- **Cost Recovery**
  - existing tariff structures do not provide incentive to build
  - rates based on embedded costs often may not provide enough revenue to cover the cost of new construction
  - Market for transmission service is short term
    - investment is risky
    - competes against generation(short lead time)

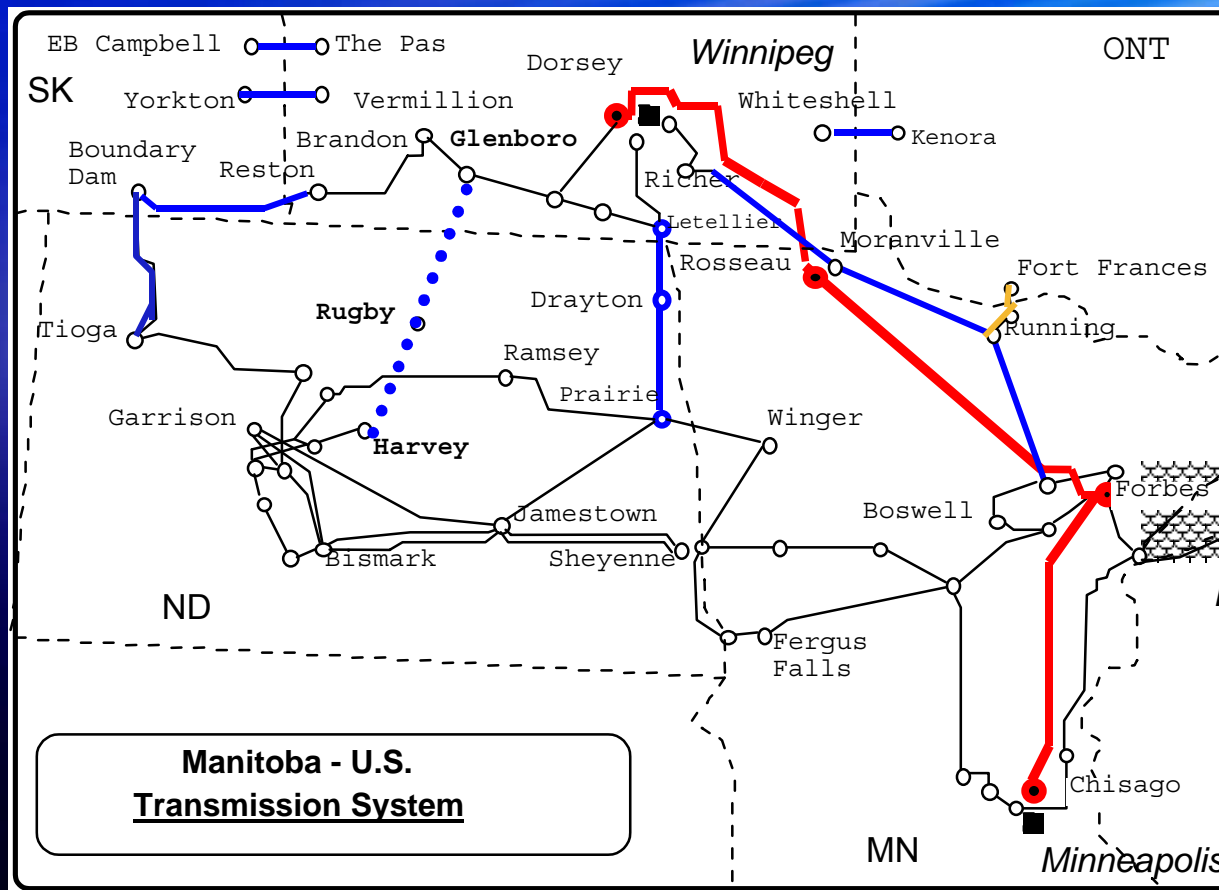
# Transmission Construction Issues

- Siting & Routing Issues
  - ROW acquisition often opposed by landowners & public interest groups based on health, environmental & other concerns
  - Schedule uncertainty - process can extend over several years
- Electricity markets are regional
  - Routing is complicated by multiple regulatory jurisdictions
  - Local regulators & public whose properties are impacted may not see the direct benefits of a regional/cross-border project

# A Recent Cross-Border Line Glenboro-Rugby-Harvey 230 kV Line

- A success story - ISD October 2002
- Time from initial commitment to expected in-service date - 3.5 years.
- Early public involvement and landowner consultation during route development
- Early communication with state/provincial governments
- Three transmission owners willing to invest

# Glenboro-Rugby Harvey Line



**Length: 200 km**

**Voltage: 230 kV**

**Inc. MH-US  
Transfer:**

**N +200 MW**

**S +200 MW**

# Glenboro-Rugby-Harvey Line

- Jurisdictions
  - North Dakota
  - U. S. Department of Energy
  - Manitoba
  - Canadian National Energy Board

# U.S.A. Permitting

- North Dakota Public Service Commission
  - Corridor Certificate
  - Route Permit
    - March 2000 – December 2000
- North Dakota Legislature
  - 2001 Session
- Federal Permitting
  - U.S. DOE Presidential Permit
    - September 2000 – February 2002

# Canadian Permitting

- Manitoba Conservation Department
  - Environmental Act License
    - August 2001 – November 2001
- Canadian National Energy Board
  - Permit to Construct and Operate an International Power Line
    - September 2001 – March 6 2002

# Conclusions

- Studies are ongoing to assess reliability and identify constraints
- Transmission expansion planning process is identifying plans to mitigate constraints
- Industry needs to address how to get transmission built in a unbundled world
  - Cost recovery - Who benefits? Who pays?
  - Multi-jurisdictional permitting, etc.

# Questions ?

**KETTLE G.S.**

