Workshop:

- Project: “Increased Utilisation of the Nordic Power Transmission System”

- The main aim of the workshop is
  - to establish a meeting place for all project participants
  - to present preliminary results from the individual projects
  - to exchange information on other relevant activities
  - discuss further work.
Outline..

- Background, overview and organisation of the project

- Current activities
  - Security assessment / Congestion management
  - Models and simulation tools for TSOs
  - System-oriented control and monitoring

- Agenda for the workshop
Background and motivation

- Common problems and challenges within the Nordic power system (one grid / one market).

- Closer cooperation among the Nordic system operators (TSOs / ISOs) through Nordel

- Nordic R&D cooperation was encouraged
Increased utilisation of the Nordic power transmission systems

Co-operation between:
- Nordic TSOs
- Universities and Research institutions
- Norges Forskningsråd

Work form (approach):
- R&D projects
- Prototype development
- PhD-studies
Increased utilisation of the Nordic power transmission systems

Main activities:

1. Security assessment / congestion management
2. Models and simulation tools for TSOs
3. System-oriented control and monitoring
1. Security assessment / congestion management

Sub-projects:

- Prototype model: Flexible transfer limits
  - Implement on-line tool for determination of flexible transfer limits (Statnett)

- Proposed R&D-project:
  - Security assessment (common Nordic project)

- PhD-study:
  - NTNU: “Consequences of transmission system failures”
2. Models and simulation tools for TSOs

Two sub-projects:

- **System models for market and network operation**
  - Market interfaces and network models for EMS applications
  - Modelling tool with focus on system operation and security related problems (secondary control, congestion management, system protection, etc.).

- **Area price determination based on network equivalents**
  - Implementation of a Nordic power system model based on area equivalents.
  - Development of a prototype market simulator

- PhD-study
  - “TSO simulator”
3. System-oriented control and monitoring

- Three sub-projects with main activities:
  - Model development and validation
  - Power system stability assessment
  - New power system control and monitoring applications
  - System operation (and system protection) with increasing wind power and distributed generation

- PhD-studies:
  - HUT: “Powerdamp”
  - DTU: “System protection”
Sub-project 3.1: System stability assessments (Statnett)

Planned activities and status:

1. Overview of wind power technology and power system implications
   - Presentation at Statnett, June 6, focusing on:
     - Technology overview and wind farm configurations
     - Network and system operation challenges

2. Implementation of wind farm model for PSS/E
   - Focus on variable speed, DFIG

3. Measurements at Havøygavlen (assistance to Statnett)

4. Data analysis, model tuning and validation
Sub-project 3.2: Stability assessment (Fingrid)

Activities 2003:

1. Follow-up on HVDC stabilizer assessments

2. Study on controlled series compensation
   - Modeling and control
   - Identify locations
   - Analysis (performance and benefits)

3. Study on controlled shunt compensation
   - Modeling and control
   - Identify locations
   - Analysis (performance and benefits)
Sub-project 3.3: System operation.. (Elkraft System)

Proposed activities:

1. Continuation of wind farm model developments
   - Improvements on existing model
   - Model validation
   - Initialisation of induction machine models.

2. Case studies on system and network impacts from large offshore wind farms in Eastern Denmark
   - Methods and models
   - Voltage control and voltage stability
   - Transient stability