

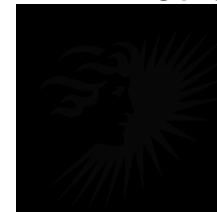
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# A Static Transfer Switch (STS) Application to Enhance Power Quality at an Automobile Components Plant

**Bill Carter**

**Director --Transmission Planning**

**Detroit Edison**



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# Focus of today's discussion:

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STS at DECo's Norway Substation  
feeding Ford components facility

- Justification and economics for the STS
- Application considerations
- Summary of DECo's experience--The good & the not as good

# Overall Status

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- January 1996 a Tailored Collaboration was signed with EPRI
- Design meetings were held at DECo and switch manufacturer in March 1996
- STS received in September 1996, installed, tested, & placed in service in November 1996
- 14+ months of experience

# Justification/economics:

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- Plant management upset with service quality during 1st year of Special Manufacturing Contract (SMC)
- Avoid SMC service guarantee payments
- New technology offers PQ mitigation opportunities, but requires substantial investment in time (study, design, monitor, etc.) and dollars for equipment

# Justification/economics:

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- Reduce plant disturbances (outages and sags) from level unsatisfactory to customer in 1995 to no more than 2 per year
- Selection team composed of planning, operations, engineering, marketing, and customer personnel

# Application considerations: Background

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- Alternatives examined: STS, DVR, SMES, Solid State LTC, Battery Storage Systems
- Key considerations: cost, delivery, probability of success
- Ability to open ties in subtransmission network made STS best solution
- Circuit work in area--PTM, rebuilds, and opening of ties

# Application considerations: Status

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- STS “options”--SCADA, bypass, motor ops, backup A/C, ATO remains in plant power house
- Independence of feeds crucial to mitigate PQ problems--criteria: any fault on preferred feed should not result in unacceptable voltage on the alternate; faults on 40- & 120-kV source were studied

# One year plus of STS experience: Background

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- Team involved in overseeing installation composed of planning, engineering, and operations personnel continue to monitor and address emerging issues
- Goals
  - Minimize plant disturbances
  - Maximize availability of STS
  - Maximize time plant is on preferred feed

# One year plus of STS experience: Status

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- Outage & sag history
  - Ten disturbances avoided
    - ✦ 5 momentary outages to 40-kV trunk line
    - ✦ 2 voltage sags from area 120-kV outages
    - ✦ 3 voltage sags from distribution outages
  - One disturbance occurred due to gate failure in December 1997
  - 17 disturbances impacted plant in 1995
  - Summary of sag experience for 1997

# One year plus of STS experience: Status (cont'd)

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- SMC service guarantee payments avoided--\$360,000
- STS performance
  - First year: 96.6% availability
  - July 8 replacement of A/C units
  - Gate drive component replacement attributed to high temperature
  - Minor adjustments--cabinet leaks, phase angle inhibit, fine tune voltage transfer settings

# Key Issues & Next Steps

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- Maintain availability
- Restore customer's confidence
- Prompt resolution of issues & problems
  - Monitor and analyze each transfer
  - STS operation database
- STS is now in DECo's tool bag for mitigating PQ problems
- STS is under consideration for other locations



# Figures



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