

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

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# Focus of today's discussion:

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STS at Norway Substation serving Ford components plant

- Justification and economics for the STS
- Application considerations
- Summary of experience

# Overall Status

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

# Justification/economics:

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- Declining reliability 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 money for equipment

# Justification/economics:

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- Goal - reduce outages and sags from an unsatisfactory level in 1995 to no more than 2 per year by applying new technology
- Selection team composed of planning, operations, engineering, marketing, and customer personnel

# Application considerations:

## Background

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- Alternatives examined: STS, DVR, Solid State LTC
- Key considerations: cost, delivery, probability of success
- Ability to modify the 40-kV network made STS better solution
- Circuit work in area--PTM & rebuilds

# Application considerations:

## Status

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- 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
- STS “options”--SCADA, bypass, motor ops, backup A/C, ATO remains in plant power house

# 2+ years of STS experience:

## Status

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- Outage & sag history
  - 7 outages and 6 sags ( $V < 75\%$ ,  $\geq 6$  cycles) avoided due to the STS
  - 2 outages and 18 sags avoided due to preferred/standby
  - Success: 1 disturbance during the last 29 months (STS mishap) compared to a high of 17 disturbances/year prior to STS

# 2 year +of STS experience: Status (cont'd)

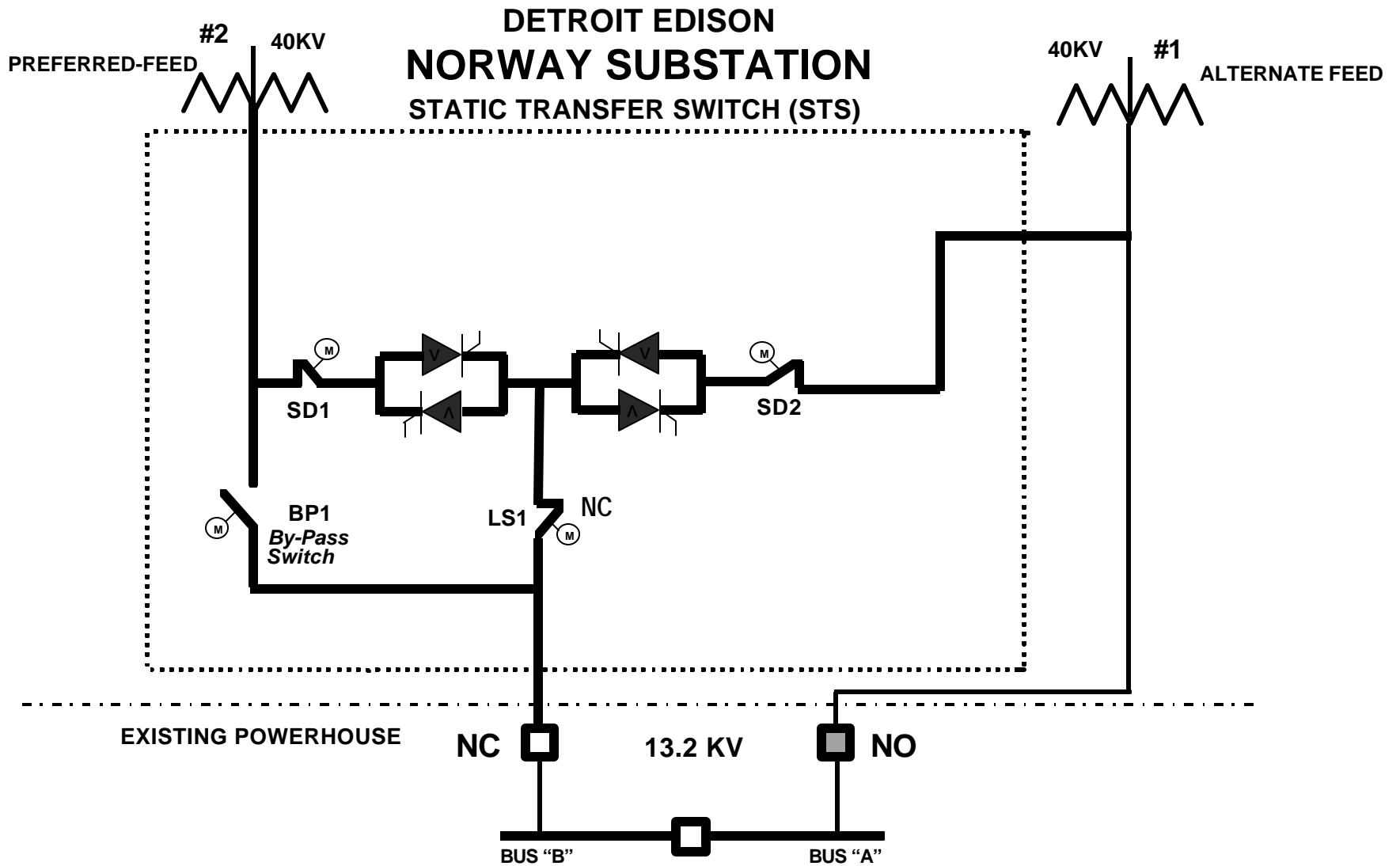
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- SMC service guarantee payments avoided; two year payback.
- STS performance
  - 1997: 96.6% availability (down-time from A/C unit and gate drive component replacements, setting adjustments)
  - 1998-99: 99.9% availability

# Key Issues

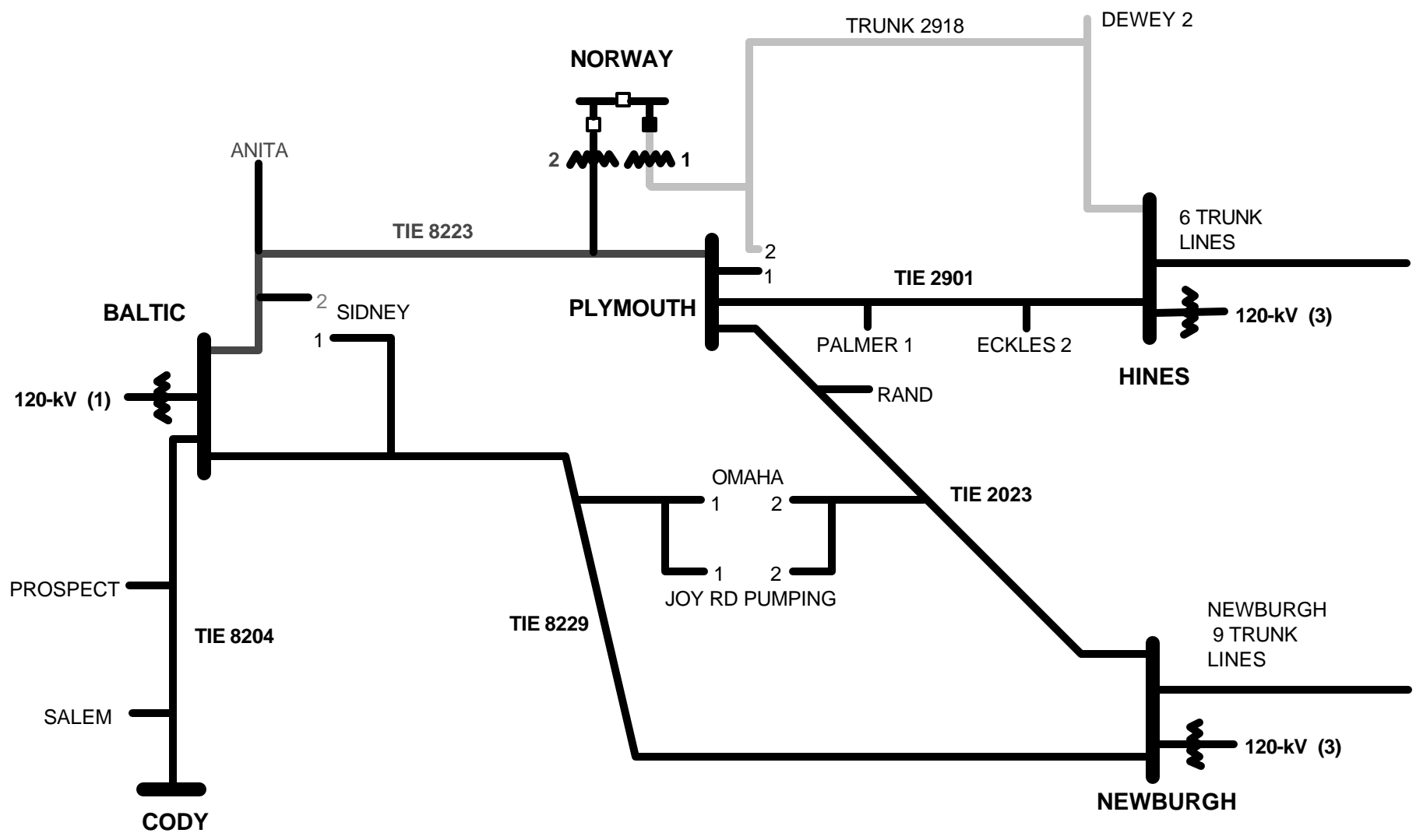
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- Maintain STS availability
- Maintain customer's confidence
- Prompt resolution of issues & problems
  - Monitor and analyze each transfer
  - STS operation database
- STS has been considered for other customers



Detroit Edison Norway Substation





Detroit Edison 41.57 kV Subtransmission Network

