Water Transmission Systems (WTS)
Why do we need WTS?

Supply water to areas with-
- Scarce ground water resources such as Saudi Arabia
- Hill and Mountain Terrain such as Asir Region in Saudi Arabia
- No surface water sources like lakes and rivers
Challenges that WTS designers need to address:

- Design new WTS with incomplete information concerning future water demand.
- Increase in water demand caused by population and economic growth.
- Inadequate operating pressures to meet higher-than-expected demands in the future.
- Pipe-diameter decisions

Safety and Reliability

- Pipe Ruptures
- Pump outage
- Leak Detection
Eastern Province Water Transmission System Phase – 2 Project

- **Customer:** Saline Water Conversion Corporation (SWCC)
- **Consultant:** ILF Engineers
- **Main Contractor:** YUKSEL
- **Sub Contractor:** Siemens N.V./S.A.
Project Scope

Eastern Province Water Transmission System Phase – 2 Project

- Complete Design, Engineering and Procurement of I&C System
  - Field Instruments
  - SCADA & Control System
  - Interfacing of I&C System at Existing Sites of EPWTS Phase 1
  - Control Room Furniture
  - Cabling for Instrumentation and Control Equipment

- Complete Design, Engineering and Procurement of Telecommunication System
  - Fiber Optic Communication System
  - PABX and Telephone System

- Services for I&C and Telecommunication System
  - Supervision of Installation
  - Startup and Commissioning Services
  - Training and Familiarization Program
  - Warranty Services
Interfaces

- CS7 Interface – Al-Aziziyah & HWTS
- Third Party Interfaces:
  - Cooling Water System – (Hardwired, Yuksel still finalizing on supplier)
  - Cathodic Protection System – (TCP/IP Interface, Info awaited from Yuksel after meeting dtd. 17/01)
  - Common Signals (F&G, Lighting, UPS, HVAC) – (Hardwired, signals used on assumptions)
  - Surge Vessels & Compressor – (Hardwired, signals used on assumptions)
  - Chlorination System – (Hardwired, signals used on assumptions)
  - Yokogawa Interface – (Hardwired, On-going co-ordination with Yokogawa)
  - DSAL Plant Interface – (Hardwired, Info awaited from Yuksel)

- Signal Interfaces
  - Motors & Pumps – (Termomeccanica)
  - Valves & Actuators – (Magwen) (Still not all valves are confirmed Motorized or Hydraulic ?)
  - Instruments – (Siemens)
  - LV, MV & ATT – (Siemens Belgium) – Typicals received awaiting detailed information)
Project Progress - Summary

TARGETS ACHIEVED:

• Basic Design for I&C Package submitted to ILF for Approval
• Basic Design for Communication system including PABX submitted to ILF for Approval
• Room Layouts and Panel Typical Drawings for both Control & Communication System are approved
• Cables List & Cable Routing Plan submitted
• IO list are being Finalized: (with assumptions for missing information) - submitted

TASK UNDER PROGRESS:

• Ordering for Instruments and Automation equipment on hold due to Technical Specs & Datasheets not approved by customer.
• Finalization of Panel Manufacturers for the Control System
• Interface report for Existing Site preparation in Progress – to be submitted end of December
• Software Engineering for STATCON and UNCON for PS1 under progress

FUTURE TASKS:

• Panel Manufacturing
• Preparation of IFAT and SAT Procedures
• Procurement of sub-system packages (Communications, PABX, Instruments, SCADA)
Major Water Transmission Systems
<table>
<thead>
<tr>
<th>Western Region</th>
<th>Eastern Region</th>
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<tbody>
<tr>
<td>1. Al-Shoaibah-Jeddah</td>
<td>1. Eastern province</td>
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<tr>
<td>3. Yanbu-Madinah</td>
<td>Base and Jubail Pipelines</td>
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<td>4. Aseer</td>
<td>3. RIYADH Water Feeding System</td>
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<td>5. Al-Shoaibah Phase 3</td>
<td>4. Khobar-Hofuf</td>
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<td>6. Rabigh</td>
<td>5. Riyadh - Sudair - Qassem</td>
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<td>7. Qunfidah</td>
<td>6. Al Khafji</td>
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<td>7. Buraydah Feeding System</td>
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WT Major Project References

- **460 KM WTS & Distribution**
  - SCADA System
  - Human Machine Interface
  - Leakage detection system

  Largest Potable WS at the time of its implementation in early 80s

- **460 KM WTS & Distribution**
  - SCADA System
  - COMMUNICATION SYSTEM
  - Leakage detection system

- **Spanning Five Major Locations**
  - Redundant SCADA & Control System
  - Human Machine Interface
  - Communication through fiber optic cables
  - Leakage detection system

- **143 KM WTS & Distribution**
  - Daily capacity of 20MIGD, with future provision of 40MIGD.
  - SCADA, PLC & OTN based telecontrol system
  - PTT back up communication
  - Pipeline Leakage detection system

- **170 KM twin transmission pipeline**
  - Daily capacity of 360,000 m3/d
  - HV & MV energy distribution
  - MV motors and VSDs
  - SCADA, PLC & OTN based telecontrol system
  - Pipeline leakage detection system

RWTS Jubail Riyadh Line-A&B WTS
RWTS Jubail Riyadh Line-C WTS
Eastern Province WTS
Hofuf WTS
Hunnay WTS