

# NERC

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

## NERC Transmission Operator (TOP) Certification of Trans Bay Cable (TBC) (NCR03036)

Site Visit Conducted  
June 2-3, 2010  
TBC Control Center  
Walnut Creek, CA

to ensure  
the reliability of the  
bulk power system

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## Introduction

This report presents the results of the Western Electricity Coordinating Council's (WECC) efforts to endorse Trans Bay Cable (TBC) (NCR03036) as a Transmission Operator (TOP) certified by the North American Electric Reliability Corporation (NERC).

TOPs have a primary responsibility for maintaining the real-time reliability of the local transmission system, and operate, or direct the operations of, the transmission facilities. Acceptable reliability levels can be maintained only if the TOPs (and other entities that make up the Interconnection) function in accordance with good operating practices and reliability criteria, including the planning and operating standards as defined by the NERC Reliability Standards. Good operating practices include, but are not limited to, full compliance with the NERC Reliability Standards without regard to economic consideration, or burdening neighboring systems.

## Certification Team

On Nov 13, 2009, TBC submitted a new organization registration application to WECC requesting the TOP registration. This began the process for certification that is outlined in the NERC Rules of Procedure (RoP) Section 500 and RoP Appendix 5. Following receipt of TBC's request to become a NERC-certified TOP, a TOP Certification Team (CT) was formed. The team rosters for members of both the CT and the TBC teams are listed in Attachment 1.

## Objective and Scope

The objective of this review was to assess TBC's processes, procedures, and tools which will allow them to perform the function of a TOP. The scope of the review included: (1) Interviewing TBC's management and reviewing pertinent documentation for verification of basic requirements for TOP operation; (2) reviewing procedures, and other documentation developed by TBC to meet the applicable standards/ requirements; (3) interviewing TBC system operations personnel; (4) reviewing TBC's primary and back-up control center (BUCC) facilities' capabilities, Energy Management System (EMS), communication facilities, operator displays, etc. and (5) performing other validation reviews as considered necessary. An on-site review was held at the main TBC office in Pittsburg, CA on June 2-3, 2010.

## Overall Conclusion

The certification process was completed in reasonable accordance with the aforementioned RoP to determine if TBC has the necessary tools, processes, and procedures to perform the function as a NERC-certified TOP. TBC presented to the CT the necessary evidence for its review as it relates to the applicable standards/requirements. Because of this review, the CT has reasonable assurance that TBC does have the tools, processes, and procedures in place to reliably perform the TOP function.

Therefore, the TOP Certification Team recommends to WECC that they approve certification of TBC as a NERC-certified TOP.

TBC TOP operations are currently slated to begin on or about September 01, 2010.

## Needed for Operation

While the team recommends to WECC that TBC be granted certification, the following work-in-progress items must be completed **prior** to the TBC TOP becoming operational:

- EOP Training completed with TBC operators
  - Per posted schedule – Training completed on July 9, 2010
- COM-001 R1, need to identify the contact point as “WECC-RC” vs. “VRCC”
  - Need to globally replace VRCC with WECC-RC – Replacement completed on June 6, 2010
- CAISO Evidence for
  - Attestation regarding procedures are revised
  - Training completed with operators
  - EMS testing complete & screenshots provided
  - CAISO evidence provided on June 23, 2010

## Positive Observations

- TBC procedures are footnoted to specific NERC standard and requirement
- Evidence is hyperlinked to the appropriate TBC procedure
- 100% management support of the operators
- Daily testing of the communications systems are documented in the operator logs
- The Reliability Standards Agreement (RSA) Delegation Task agreement is logical and concise regarding the JRO
- TBC requires 3 part communications regarding all real time operational decisions/actions
- Training materials and records are well managed and easy to retrieve
- Engineering pop quizzes
- Independent operator Validation & Verification of procedures with engineering
- Redundancy in back up facility capability

## Operator Preparedness

The CT found the TBC operators to be equipped with the necessary operating tools, and they are prepared to take on the TOP operations. All of TBC’s operators are NERC-certified TOP operators.

## Company Background

The CAISO has deemed that the northern San Francisco Peninsula needs additional transmission to ensure energy reliability in 2010 and beyond. In September 2005, the CAISO selected Trans

Bay Cable over its alternatives as the best transmission solution for the northern San Francisco Peninsula.

Trans Bay Cable represents the first purely privately-proposed and financed solution to meet the reliability needs of a regional utility grid in the country.

The TBC assets and Transmission system Rights are owned by Trans Bay Cable LLC. Operation and maintenance of the TBC is the responsibility of TBC Operations LLC. An O&M Services Agreement is in place between both parties.

## Operating Facility Details

- Primary Control Center (PCC)
  - Pittsburg Operations Center
  - Converter Control and Protection System/HMI.
  - Telecommunications facilities
  - 20kW UPS
- Back-up Control Center (BUCC)
  - Pittsburg Control and Protection Room
  - Converter Control and Protection System/HMI
  - Telecommunications facilities
  - 20kW UPS

## Documentation List

Copies of all of the supporting TBC documents were collected as evidence of TBC's preparedness, and will be kept as a record of evidence to support the CT's recommendation. These documents will be retained at the WECC office in Salt Lake City, UT for a period of five years.

None of the documents listed below are included with the distribution of this final report. Per the NERC Rules of Procedure, and due to the confidential nature of this material, these documents are available for review at the WECC offices after proper authorization is obtained through WECC and NERC:

- TBC Master TOP Matrix
- Letters requesting TBC Certification
- TBC's various TOP evidence files
- Documentation resulting from the "Needed for Operation" items.

## Evaluation of the TOP Standards

The certification team was able to assess the applicant's ability to reasonably meet the TOP standards/requirements as documented in the **TBC Master TOP Matrix**.

# Attachment 1

## TOP Certification Team

- Paul Rice – Asst Director Operations - WECC Lead
- Don Pape – Manager Vancouver Reliability Coordination Center - WECC
- Glenn Rounds – Electric Operations Manager – PG&E
- Jim Hughes – NERC

## TBC/other Personnel

- James Alligan –Compliance Manager – TBC LLC
- Cody Tabor – Operations Manager – TBC Operations LLC
- Samson Adigun – Operations Engineer – TBC Operations LLC
- Curt Wiebelhaus – Operations Engineer – TBC Operations LLC
- Michael Blunt – Operations and Maintenance Technicians - TBC Operations LLC
- Kevin Meagher - Operations and Maintenance Technicians - TBC Operations LLC

# Attachment 2

## Certification Process Steps

### Documentation Review

The CT also reviewed the appropriate documentation that provided reasonable assurance that TBC has the tools, processes, procedures, and training to operate as a NERC certified TOP. The CT used a spreadsheet to catalog the documentation evidence provided by TBC, namely *TBC Master TOP Matrix*. The spreadsheet contains all the applicable NERC standards and associated requirements for an entity to be evaluated as a NERC-certified TOP, along with TBC document references where evidence was provided by TBC that met the applicable standards and requirements.

### Applications Review

The site visits focused on documentation review, interview of TBC's operators, and evaluation of the TOP applications and operator toolset that TBC has available for their operators. The certification team reviewed TBC online applications that will be used to perform the TOP requirements. The following are the software Modules:

- TBC Converter Control and Protection System
- TBC uses a Sequence of Events Recorder (SER) which monitors all Alarm points for Operator access via the TBC HMI.
- All TBC facility history data are archived via the TBC Sequence of Events Recorder (SER.)
- TBC Converter Control and Protection System performs all data Acquisition functions.
- TBC uses Siemens HMI (Human Machine Interface) which displays all local and remote monitoring points received from the TBC Converter Control and Protection System.
- TBC uses Siemens HMI for project trending data
- TBC manages all outage notification via the SLIC system (Scheduling and Logging for ISO of California).

### Operational Testing

TBC conducted a series of operational tests. Operational testing focused primarily on the proper operation of the TBC project with regards to real and reactive power transfer capabilities. Operational testing included testing of Siemens HVDC Voltage Source Conversion technology and Prysmian's submarine cable technology for proper operation and reliability. During this testing period TBC tested the proper operation of the SLIC (Scheduling and Logging for ISO of California) and the CAISO ADS (Automatic Dispatch System) with the CAISO to ensure proper operation. The ADS system was used as the primary means of real power dispatch for the TBC project during the projects operational tests. Operational testing also included verification of

proper data transfer to the PG&E EMS and SCADA system along with proper data transfer to the CAISO system.

TBC has had numerous discussions to develop a communications protocol document between all parties. This coordinated communication protocol document is vital to ensure understanding of the reliability functions being performed by all parties. TBC has in place a Reliability Standards Agreement with the CAISO which outlines the responsible entity for compliance with NERC requirements and lists any delegated tasks that either party may be responsible for performing. This RSA agreement has been implemented into a JRO between TBC LLC and the CAISO.

In order to provide the Balancing Authority (CAISO) with the proper metering and telemetry data TBC has installed a DPG unit onsite to convert the Projects data to the proper protocol required by the Balancing Authority to verify TBC's data points. TBC is providing the CAISO and PG&E EMS with over 50 data points to evaluate the TBC project real power transmission levels, reactive power levels, line voltage and breaker status.

Field-testing was jointly performed by Siemens (on behalf of TBC), PG&E, and CAISO metering departments to verify the accuracy of the metering data. All transmitted data figures were compared with TBC actual meter readings in the field. The data communication received by the PG&E EMS system was verified and validated with the TBC actual readings. Test results indicated that all metering data and telemetry communication systems appeared to be working properly. All metering values for the TBC projects back up control centers where also verified and validated for accuracy.

TBC continues to use the ADS system for real power dispatch values and the SLIC outage system for project scheduling. All data transfers and communication links appear to be working properly.