

# **BNSF OPERATIONS TESTING REFERENCE GUIDE**

## **Remote Operations Testing /Audit Supplement**

April 01, 2008

### **INTRODUCTION**

Operations' testing is mandated by federal regulation and BNSF policy to determine extent of compliance with BNSF rules, policies, instructions, and procedures.

This supplement to the BNSF Operations Testing Reference Guide defines those tests/audits designed to be recorded through remote processes only. Remote operations tests/audits are performed utilizing data derived from BNSF resources including, but not limited to, locomotive event recorder data, traffic management systems, and audio communications archives.

Any operating rule deficiencies noted, other than those defined by these test/audit descriptions, may also be recorded as described.

### **MISSION STATEMENT**

Our mission is to support BNSF safety and velocity objectives through the identification and elimination of behavioral risk associated with human factor accidents/incidents by performing quality operating rule compliance analysis and providing real-time assistance for the application of operating rules.

### **OPERATIONS TEST/AUDIT PROCEDURE**

Remotely performed operations tests/audits may be staged or performed by review of occurrences satisfying criteria of the testing guidelines. Staged events will be coordinated with the chief dispatcher responsible for that territory. The testing supervisor will retrieve and utilize data from locomotive event recorders, traffic management systems, and recorded audio communications as required to determine the extent of compliance with associated rules and procedures. The date recorded will be the actual event occurrence.

Staged events should be prioritized for locations not routinely tested due to operational limitations or inaccessibility, and employees with minimal test records.

## **TEST/AUDIT RESULTS**

Remotely performed operations tests/audits are recorded and identified by unique division codes (REM and OPE) and number series of 800 – 899, indicating pass or fail. Only designated supervisors will be authorized to enter 800 series operations tests.

An important aspect of operations testing/auditing is employee feedback regarding their performance as related to BNSF expectations. Test results are provided to employees through the BNSF automated Electronic Notification System. Due to the unique process of remote testing and the inability to personally contact the employee at conclusion of the test, remote tests are recorded using “Y” in the contact field for purposes of electronic notification.

Noted exceptions are electronically communicated to the appropriate division supervisor(s) for employee review and follow up handling. This communication will include data file(s) supporting the exception. Test/audit exceptions are initially recorded indicating “07 – Pending Officer Update” in the action taken field. Upon notification by division supervisors of follow up handling with the employee, the database will be updated to properly reflect the appropriate action taken code.

## REMOTE OPERATIONS TESTS / AUDITS

R-OPT Number	Description
803*	TWC Authority Limit
809	Whistle Signal / Grade Crossing
811*	Block Signal - Stop
812*	Block Signal – Stop & Proceed
815	Block Signal – Approach
819	Signal Awareness / Position of Switch Form
821	Speed Requirement
823	Form ‘A’ Speed Restriction
824	Restricted Speed
861	TWC Non-Signaled Radio Transmission
862	After Arrival Communication - TWC
863	Signal – Radio Transmission
864	Mandatory Directive - Repeat
866	Radio Usage
868	Shoving Movement - Radio Response
869	Reporting Emergency Brake Application
872	Between Equipment
874	Automatic Warning Devices
876	TWD - Overheated Equipment Inspection
877	Hand Operated Main Track Switch Communication
878	Reporting Clear of Limits / Specific Location
881	Air Brake – Application & Release
885	Separating Train
889	Delayed Departure
899	All Other Failures

\* Indicates test is qualifying test for locomotive engineers under CFR 49, Part 240.

## **Test 803\* – TWC AUTHORITY LIMIT**

The TWC Authority Limit test determines compliance with requirements to operate within limits of Track Warrant Authority in TWC territory.

### **APPLICABLE RULES**

GCOR: 6.3, 14.1, 14.2, 14.3.

### **PROCEDURE**

This test applies to all train crewmembers.

Determine track authority limits requiring train to stop.

Verify via locomotive event recorder analysis and track authority form that train or engine stops before exceeding limits of authority provided by TW.

### **FAILURE DEFINED**

Record exception when train or engine fails to stop within the limits of authority provided by TW.

## **Test 809 – WHISTLE SIGNAL / GRADE CROSSING**

The Whistle Signal / Grade Crossing test determines compliance with whistle signal requirements approaching public road crossings at grade with engine in front and whistle signal is required (i.e., no Quiet zone in effect).

### **APPLICABLE RULES**

GCOR 5.8.2

### **PROCEDURE**

Verify via locomotive event recorder analysis, Timetable, track chart, or other resource that:

- 809-1 Lead locomotive traveling in excess of 45 MPH starts whistle signal (7) at or about the crossing sign, but not more than 1/4 mile before the crossing.
- 809-2 Lead locomotive traveling 45 MPH or less sounds whistle signal (7) at least 15 seconds, but not more than 20 seconds before lead locomotive enters the crossing.
- 809-4 Whistle signal (7) is sounded as two long, one short and one long.
- 809-5 Whistle signal (7) is prolonged or repeated from the time whistle is required to be initiated until lead locomotive passes through the crossing.

**Note:** For 809-1 through 809-5; in addition to the locomotive engineer, other crew members present in the cab of the locomotive should be failed only when the noted exception has occurred at multiple crossings.

- 809-6 This test may only be recorded as a failure. Record this test number only when the whistle is not sounded for a grade crossing where required. Other crew members should also be failed when present in the cab of the locomotive.

### **FAILURE DEFINED**

Record exception when whistle signal is not sounded as described by GCOR 5.8.2 (7).

### **DATA REPORTING**

This test has been designed to require a special code to be entered that will provide specific testing information. When prompted to enter a “Rule Book Code” the code to be entered is “G”. When prompted to enter a “Rule Number”, use the appropriate code above that reflects your observation.

## **Test 811\* – BLOCK SIGNAL – STOP**

The Block Signal – Stop test determines compliance with rules governing stop indications at control points.

### **APPLICABLE RULES**

GCOR: 9.1.15, 9.12.1, 9.12.2

### **PROCEDURE**

This test applies to all train crewmembers.

Determine location train or engine is required to stop at signal indicating stop.

Verify via locomotive event recorder analysis traffic management replay, and/or audio archives that:

- Train or engine stops before passing signal requiring stop.
- Verify crewmember repeats instructions provided when control operator verbally authorizes movement to pass signal displaying stop.

### **FAILURE DEFINED**

Record exception when train or engine fails to stop before passing signal indicating stop.

## **Test 812\* – BLOCK SIGNAL – STOP & PROCEED**

The Block Signal – Stop & Proceed test determines compliance with rules governing signals indicating stop and proceed at restricted speed.

### **APPLICABLE RULES**

GCOR: 9.1.14, 9.16

### **PROCEDURE**

This test applies to all train crewmembers.

Determine signal requires train to stop for stop and proceed indication.

Verify via locomotive event recorder analysis and traffic management replay that:

- Train or engine stops before passing signal requiring stop and proceed.
- After passing signal, train operates at restricted speed for required distance (*Document under test 824*).

### **FAILURE DEFINED**

Record exception when train or engine fails to stop before passing signal indicating stop and proceed at restricted speed.

## **Test 815 – BLOCK SIGNAL - APPROACH**

The Block Signal - Approach test determines compliance with rules governing approach signal indications.

### **APPLICABLE RULES**

GCOR: 9.1.6, 9.1.7, 9.1.8, 9.1.10, 9.1.11, 9.1.12.

### **PROCEDURE**

This test applies to all train crewmembers.

Determine location of signal indicating approach.

Verify via locomotive event recorder analysis, traffic management replay, and/or audio archives that:

- Approach signal condition exists due to next signal requiring stop.
- Where division instructions require announcing signal in advance of control point, secure audio archive of radio announcement. (*Document under test 863*).
- Determine appropriate speed reduction as required by signal indication.

### **FAILURE DEFINED**

Record exception when required speed reduction is not made or maintained.

## **Test 819 – SIGNAL AWARENESS / POSITION OF SWITCH FORM**

The Signal Awareness / Position of Switch Form test determines compliance with rules governing proper use and completion of the required form.

### **APPLICABLE RULES**

SSI Item 43

### **PROCEDURE**

This test applies to the conductor and engineer.

Review the form for proper completion in its entirety, including all required signal, switch, and flag location information.

Verify via locomotive event recorder analysis, traffic management replay, and/or audio archive review that:

- Signal information entries are consistent with traffic management replay.
- Speed information entries are consistent with locomotive event recorder data.
- Time notations indicating speed reductions as required by signal indications are consistent with event recorder data.

### **FAILURE DEFINED**

Record exception when:

- Form is not completed in its entirety.
- Signal, time, and switch information is inconsistent with activity as indicated by traffic management system, locomotive event recorder, and/or audio archives.

## **Test 821 – SPEED REQUIREMENT**

The Speed Requirement test determines compliance with maximum authorized speed requirement for a given location.

### **APPLICABLE RULES**

GCOR: 6.31, SSI, and Division Timetable Instructions

### **PROCEDURE**

This test applies to all train crewmembers.

Determine maximum authorized speed for train or engine.

Verify via locomotive event recorder analysis and traffic management replay that:

- Train or engine does not exceed maximum authorized speed.
- Do not record this test to document speed requirements for Form A temporary speed restrictions or restricted speed. (*Use test numbers 823 or 824*).

### **FAILURE DEFINED**

Record exception when frequent or prolonged speed infractions are noted.

## **Test 823 – FORM ‘A’ SPEED RESTRICTION**

The Form ‘A’ Speed Restriction test determines compliance with temporary speed restrictions.

### **APPLICABLE RULES**

GCOR: 5.4.1, 15.0

### **PROCEDURE**

This test applies to all train crewmembers.

Determine maximum authorized speed for train or engine where a temporary speed restriction effects train movement.

Verify via locomotive event recorder analysis, traffic management replay, and/or audio archive review that:

- Train is issued Form A temporary speed restriction.
- Movement does not exceed speed defined by Form A temporary speed restriction.

### **FAILURE DEFINED**

Record exception when frequent or prolonged speed infractions are noted.

## **Test 824 – RESTRICTED SPEED**

The Restricted Speed test determines compliance with maximum allowable speed requirement (20 mph) when restricted by GCOR 6.27.

### **APPLICABLE RULES**

GCOR 6.27

### **PROCEDURE**

This test applies to all train crewmembers.

Conduct this test in conjunction with other remote operations tests requiring movement at restricted speed or any time movement at restricted speed is required.

Determine location where restricted speed is required.

Verify via locomotive event recorder analysis, traffic management replay, and/or audio archive review that:

- Movement does not exceed 20 mph where required.

### **FAILURE DEFINED**

Record exception when speed exceeds 20 mph before leading wheels reach a location where speed may be increased.

## **Test 861 – TWC NON-SIGNALED RADIO TRANSMISSION**

The TWC Non-Signaled Radio Transmission test determines compliance with requirement to announce train's approach approximately 2 miles in advance of siding or junction in non-signaled TWC territory.

### **APPLICABLE RULES**

SSI Item 15 - GCOR and MW Operating Rules, Supplemental Instructions.

### **PROCEDURE**

This test applies to all train crewmembers.

Determine crewmember announces train's approach approximately 2 miles in advance of a siding or junction in non-signaled territory.

Verify via locomotive event recorder analysis, track authority form, and/or audio archive review.

### **FAILURE DEFINED**

Record exception when:

- Crewmember does not make the required radio transmission approximately 2 miles in advance of siding or junction.
- Radio transmission does not contain the required information.

## **Test 862 – AFTER ARRIVAL COMMUNICATION - TWC**

The After Arrival Communication - TWC test determines compliance with communication requirements when after arrival authority is issued in TWC non-signaled territory.

### **APPLICABLE RULES**

SSI Item 15 - GCOR and MW Operating Rules, Supplemental Instructions.

### **PROCEDURE**

This test applies to all train crewmembers.

Determine compliance with communication requirements when after arrival authority is issued in TWC non-signaled territory.

Verify via locomotive event recorder analysis, track authority forms, and/or audio archive review.

### **FAILURE DEFINED**

Record exception when:

- Briefing does not occur between train dispatcher and train crew receiving after arrival authority, with reference to specific identification of train to be met (by both parties).
- Train crew to receive TW containing after arrival authority fails to establish the location of train to be listed in after arrival authority, advising dispatcher direct communication has been made.
- Recipient of TW with after arrival authority is not stopped prior to TW being issued.
- Train crew with after arrival authority fails to establish positive radio contact confirming identity of passing train listed in after arrival authority after the meet has occurred. (Note: If radio communication cannot be established, train dispatcher may provide confirmation.)

## **Test 863 – SIGNAL - RADIO TRANSMISSION**

The Signal – Radio Transmission test determines compliance with requirement to transmit specific information by radio when passing signals in advance of control points as defined by individual division instructions.

### **APPLICABLE RULES**

Individual Division Instructions, General Orders, or Notices

### **PROCEDURE**

This test applies to all train crewmembers.

Determine radio transmission of specific signal information is required by division instructions at the location tested.

Verify via locomotive event recorder analysis, traffic management replay, and/or audio archive review that crewmember transmits information defined by division instructions.

### **FAILURE DEFINED**

Record exception when crewmember fails to transmit required information by radio.

## **Test 864 – MANDATORY DIRECTIVE - REPEAT**

The Mandatory Directive – Repeat test determines compliance with proper repeat of verbally issued Mandatory Directives.

### **APPLICABLE RULES**

GCOR: 2.14, 2.14.1

### **PROCEDURE**

This test applies to crewmember repeating Mandatory Directive.

Determine a Mandatory Directive has been verbally issued.

Verify via audio archive review and/or track authority form.

### **FAILURE DEFINED**

Record exception when:

- Name of employee copying is not provided prior to Mandatory Directive being verbally issued.
- Repetition of Mandatory Directive is incorrect.

## **Test 866 – RADIO USAGE**

The Radio Usage test determines compliance with proper radio procedure.

### **APPLICABLE RULES**

GCOR: 2.2, 2.4, 2.10, 2.11, 6.1.

### **PROCEDURE**

This test applies to crewmember using radio.

Determine employee uses radio properly.

Verify via audio archive review that:

- Transmission includes proper identification.
- Transmission includes proper terminology.
- Transmission is necessary and appropriate.
- Instructions are repeated properly.
- Do not record this test for repeat of verbally issued Mandatory Directive (*Use test 864*).

### **FAILURE DEFINED**

Record exception when:

- Proper identification is not provided.
- Terms “over” and “out” are not used in other than yard switching.
- Communication is unnecessary or inappropriate.

## **Test 868 – SHOVING MOVEMENTS - RADIO RESPONSE**

The Shoving Movements – Radio Response test determines compliance with required communication when shoving movements are made by radio.

### **APPLICABLE RULES**

GCOR: 5.3.7, 6.5, SSI Item 15 - GCOR and MW Operating Rules, Supplemental Instructions.

### **PROCEDURE**

This test applies to employees communicating and acknowledging instructions during shoving movement by radio.

Verify via locomotive event recorder analysis and/or audio archive review.

### **FAILURE DEFINED**

Record exception when:

- Term “ahead” is not used when instructing engineer to move forward.
- Term “back up” is not used when instructing engineer to move backward.
- For continuous moves, distance is not communicated by at least half the distance plus one car length until the distance is 2 car lengths, then 2 cars, 1 car, 25 feet, and then the word “stop”.
- Radio communication is not acknowledged by engineer when distance specified is more than 4 cars. (Engineer exception only.)
- Speed exceeds 20 mph for freight trains.
- Shoving movement occurs before engineer knows who is protecting the movement and how protection will be provided.

## **Test 869 – REPORTING EMERGENCY BRAKE APPLICATION**

The Reporting Emergency Brake Application test determines compliance with requirement to notify train dispatcher or control operator of emergency brake application and requirement to warn others by radio of emergency brake application when adjacent main track or controlled siding may be obstructed.

### **APPLICABLE RULES**

GCOR: 2.10, 6.23, ABTH 103.8.4

### **PROCEDURE**

This test applies to all train crewmembers.

Determine emergency brake application and required warning/notification has occurred.

Verify via locomotive event recorder analysis and audio archive review.

### **FAILURE DEFINED**

Record exception when:

- Audio archives indicate no warning to others by radio of possible obstruction to adjacent main track or controlled siding, if required.
- Train dispatcher or control operator is not notified of emergency brake application including required information.

## **Test 872 – BETWEEN EQUIPMENT**

The Between Equipment test determines employee in control of the locomotive complies with requirements when another employee will be going between or working on the end of rail equipment.

### **APPLICABLE RULES**

TY&E Safety Rules S-13.1.1

### **PROCEDURE**

This test applies to locomotive engineer in control of locomotive.

Determine radio communication is used to signal an employee will be going between or working on the end of rail equipment.

Verify via locomotive event recorder analysis and audio archive review that:

- Movement is stopped, reverser centered, and independent brake fully applied prior to employee controlling locomotive stating “Set and Centered” when acknowledging an employee will be going between or working on the end of rail equipment.
- Brakes remain applied and the reverser centered until the crew member requesting protection gives a signal indicating, “in the clear.”

### **FAILURE DEFINED**

Record exception when:

- Movement does not stop prior to acknowledging a request to go between or work on the end of rail equipment.
- Reverser is not centered and independent brake is not fully applied prior to acknowledging request to go between or work on the end of rail equipment.
- Reverser moved from center or independent brake released prior to signal indicating, “in the clear.”

## **Test 874 – AUTOMATIC WARNING DEVICE**

The Automatic Warning Device test determines compliance with requirements to protect movement over road crossings when notified that automatic warning devices have an activation failure, are disabled, or malfunctioning.

### **APPLICABLE RULES**

GCOR: 1.13, 6.32.2, SSI Item 15 - GCOR and MW Operating Rules, Supplemental Instructions.

### **PROCEDURE**

This test applies to all crewmembers occupying the controlling locomotive cab.

Determine location crewmembers are required to protect movement over grade crossing as instructed by train dispatcher when notified that automatic warning devices have an activation failure, are disabled, or malfunctioning.

Testing supervisor may coordinate test with signal department to notify train dispatcher of crossing protection requirement.

Verify via locomotive event recorder analysis, traffic management replay, and/or audio archive review that:

- Train dispatcher issued written or verbal instructions for train to protect crossing.
- Unless otherwise provided, movement does not exceed 15 mph until head end of train completely occupies the crossing.
- If required, movement stops before occupying crossing.

### **FAILURE DEFINED**

Record exception when:

- Movement exceeds 15 mph before head end of train completely occupies crossing unless otherwise provided.
- If required, movement does not stop before occupying crossing.

## **Test 876 – TWD – OVERHEATED EQUIPMENT INSPECTION**

The TWD - Overheated Equipment Inspection test determines compliance with requirements for trains receiving overheated equipment alarms.

### **APPLICABLE RULES**

SSI Item 8 (D)

### **PROCEDURE**

This test applies to all train crewmembers.

Determine occurrence of train receiving overheated equipment alarm reported to the Signal Call Desk.

Verify via locomotive event recorder analysis, traffic management replay, and/or audio archive review that:

- Train is stopped following receipt of overheated equipment alarm.
- Train crew immediately informs train dispatcher of the alarm.
- Train moved at no more than 10 mph during inspection.
- Crewmember communicates all required information to NOC Warm Bearing desk.
- Crewmember communicates all required information to train dispatcher.
- Train crew receives inspection release from NOC Warm Bearing desk and permission from train dispatcher before departing inspection location.

### **FAILURE DEFINED**

Record exception when:

- Train does not stop after receiving an overheated equipment alarm to perform required inspection.
- Required information is not provided to the NOC Warm Bearing desk (Physical axle count, use of heat indication crayon or infrared device, inspection of 12 axles forward and rear of indicted axle if no defect found).
- Required information is not provided to train dispatcher (Delay/TWD alarm information including: axle readout, inspection result, car initial and number, journal number & size, set out location, use of crayon, etc.).
- Indicated car is not set out if heat indicating crayon or infrared device unavailable.
- Departing inspection location prior to release by NOC Warm Bearing Desk.
- Departing inspection location prior to release by train dispatcher.

## **Test 877 – HAND OPERATED MAIN TRACK SWITCH COMMUNICATION**

The Hand Operated Main Track Switch Communication test determines compliance with communication requirements when main track switches are hand operated in TWC non-sigaled or double track ABS territory.

### **APPICABLE RULES**

SSI Item 43

### **PROCEDURE**

This test applies to all crew members.

Determine communication occurs between the crewmember hand operating the main track switch and the locomotive engineer.

Verify via track authority form and/or audio archive review.

### **FAILURE DEFINED**

Record exception when:

- Required communication does not occur between crew members.
- Required communication does not occur between crew members in the proper format.

## **Test 878 – REPORTING CLEAR OF LIMITS / SPECIFIC LOCATION**

The Reporting Clear of Limits / Specific Location test determines compliance with requirements for reporting clear of authority limits or having passed a specific location in TWC territory.

### **APPLICABLE RULES**

GCOR: 14.7, 14.10, SSI Item 14 - GCOR Changes and Additions, SSI Item 15 - GCOR and MW Operating Rules Supplemental Instructions.

### **PROCEDURE**

This test applies to all crewmembers.

Determine location and time reported clear or having reported passed

Verify via locomotive event recorder analysis, track authority form, and/or audio archive review that:

- Job briefing clearly identifies which authority is being reported clear.
- Train is completely clear of limits reported clear or having passed.
- ETD and HTD indicate brake pipe continuity at time of report.
- Job briefing includes position of MT switch information and reference to completion of Position of Switch Form, when required.

### **FAILURE DEFINED**

Record exception when:

- Field employee does not clearly brief Train Dispatcher/Control Operator which authority is being reported clear.
- Train is not clear of location reported.
- Electronic verification of brake pipe continuity is absent at time of reporting unless other means of verification has occurred.
- Job briefing provided to train dispatcher is incomplete.
- Position of MT switch information and reference to the completion of the Position of Switch Form is not provided to train dispatcher where required.

## **Test 881 – AIR BRAKE – APPLICATION & RELEASE**

The Air Brake – Application & Release test determines compliance with Class 3 Air Brake Test requirements.

### **APPLICABLE RULES**

ABTH: 100.8, 100.15

### **PROCEDURE**

This test applies to all crewmembers.

Verify via locomotive event recorder analysis that an application and release test was properly completed when a train's consist changes enroute as defined by rule.

### **FAILURE DEFINED**

Record exception when:

- Air brake system is not charged to within 15-psi of regulating valve setting, evidenced by ETD.
- A 20-psi brake pipe reduction is not made with the automatic brake valve.
- ETD does not indicate a brake pipe pressure decrease of at least 5-psi, indicating brakes applied and at least a 5-psi increase, indicating brakes released.

## **Test 885 – SEPARATING TRAIN**

The Separating Train test determines compliance with procedure when a portion of train is left standing, detached from locomotives or yard air, to ensure brake pipe pressure is not maintained (bottling air).

### **APPLICABLE RULES**

ABTH 102.1.2

### **PROCEDURE**

This test applies to all crewmembers.

Verify via locomotive event recorder analysis that:

- A 20-psi automatic brake application is made.
- ETD pressure drops to zero at an emergency rate.
- When train is separated below 25 degrees F on grades of less than 1%, brake pipe pressure may be reduced to zero at a service rate as outlined in exception.

### **FAILURE DEFINED**

Record exception when:

- A 20-psi automatic brake application was not made prior to train separation.
- ETD continues to indicate brake pipe pressure following separation of train.

## **Test 889 – DELAYED DEPARTURE**

The Delayed Departure test determines compliance with requirement to apply air brakes on a train that has been stopped and movement has been delayed for any reason, when operating conditions permit.

### **APPLICABLE RULES**

ABTH 103.3 (B)

### **PROCEDURE**

Verify via locomotive event recorder analysis, traffic management replay, and/or track chart that:

- Air brakes are applied when a train is stopped and operating conditions permit.
- Brake pipe reduction is increased to at least 15-psi, when operating conditions permit.
- HTD and ETD indicate brake pipe continuity at time of release and departure.

Note: An example of an operating condition that may not allow brakes to remain applied until ready to depart, or no additional increase in brake pipe reduction after stopping would be when near a long descending heavy or mountain grade and brake system requires full charge before proceeding.

### **FAILURE DEFINED**

Record exception when event recorder data indicates air brake reduction is not made or increased to at least 15-psi where a train stops and movement is delayed, if operating conditions permit.

*Requirement also applies in terminals when delayed following air test.*

## **Test 899 – ALL OTHER FAILURES**

Any rule violation noted during remote operations testing/auditing other than those defined by the Remote Operations Test/Audit Supplement may be recorded in the operations testing database to allow management access to information regarding rule compliance. Violations of this manner may be recorded using this test number, with identification of the specific rule number in the data base.