AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
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APPENDIX C TO PART 230—FRA INSPECTION FORMS

Appendix C - FRA Inspection Forms

Form No. 1 **31 and 92 Service Day Inspection Report**

Date of Inspection_____ Owner_____ Locomotive Initials_____

Operator_____ Locomotive No._____

31 and 92 Service Day Requirements

Instructions: Non-complying conditions shall be repaired and this report approved before the locomotive is returned to service. Where condition is called for, enter either: **(1) Good -** No defects which could be discovered by a reasonable inspection; **(2) Fair -** Functioning less than optimally but safe and suitable and not in violation of the regulations; or **(3) Poor -** Not in compliance with the regulations. In any case N/A means - not applicable.

Was boiler washed?_____

Were water gauge and valve passages cleaned?_____

Were gauge cock passages cleaned?_____

Were all washout plugs removed and inspected?_____

Were arch tubes, circulators, siphons and water bar tubes cleaned and inspected?_____

Were fusible plugs removed, cleaned & inspected?_____

Were staybolts hammer tested?_____

Were all broken staybolts replaced?_____

Were steam leaks repaired?_____

Condition of draft system and draw gear._____

Condition of running gear._____

Condition of driving gear._____

Condition of spring/equalizing system._____

Condition of tender running gear._____

Condition of brake equipment._____

Were injectors tested and in good condition?_____

Was feedwater pump tested and in good condition?_____

92 Service Day Requirements

Date of previous 92 Service Day Inspection_____

Safety relief valves pop at_____psi_____psi_____psi

Were all steam gauges tested?_____

Were all air brake gauges tested?_____

Were steam gauge siphon pipe(s) cleaned?_____

Were tubular water glasses renewed?_____

Were air compressor(s) orifice tested?_____

Was main reservoir tested for leakage?_____

Were brake cylinders tested for leakage?_____

Was tender tank entered and inspected?_____

If no 92 Service Day Inspection is done, enter number of service days used since last 92 Service Day Insp._____

_____
INSPECTOR

_____
INSPECTOR

The above work has been performed and the report is approved._____
OFFICER IN CHARGE

Form No. 2

Daily Locomotive Inspection Report

Date of Inspection_____ Owner_____ Locomotive Initials_____
Operator_____ Locomotive No._____

Instructions: Non-complying conditions shall be repaired and this report approved before locomotive is returned to service. This report shall be filed even if no non-complying conditions are reported, however it does not have to be approved before the locomotive is returned to service if no non-complying conditions are reported. Locomotive, including its tender and appurtenances, shall be inspected each day it is offered for use.

Repairs needed:	**Repairs done by:**

CONDITION OF WATER GLASSES:_____ _____

CONDITION OF GAUGE COCKS:_____
LP_____**psi**

CONDITION OF INJECTORS / PUMPS:_____

BOILER SAFETY VALVE LIFTS AT:_____**psi**

SEATS AT:_____**psi**

CONDITION OF PISTON ROD AND VALVE STEM PACKING_____

CONDITION OF AIR COMPRESSOR:_____

MAIN RESERVOIR PRESS.: HP_____**psi,**

BRAKE PIPE PRESSURE:_____ _____**psi**

LOCOMOTIVE BRAKE PIPE LEAKAGE:_____**lbs. per minute**

CONDITION OF BRAKES:_____

CONDITION OF SANDERS:_____

Where condition is called for enter:

Good - No defects which could be discovered by a reasonable inspection.
Fair - Functioning less than optimally but is in safe and suitable condition, and not in violation of the rules.
Poor - Not in compliance.
N/A - Not applicable.

Inspector's signature:_____ **Occupation:**_____

The above work has been performed, except as noted, and the report is **approved by:**_____

_____ **Occupation**
_____ **Date**

Approved

Note: Additional items may be added to this form if desired.

Form No. 3 **Annual Inspection Report**

Date of Inspection_____ Owner_____ Locomotive Initials_____

Operator_____ Locomotive No._____

Instructions: Non-complying conditions shall be repaired and this report approved before the locomotive is returned to service. Where condition is called for, enter either: **(1) Good** - No defects which could be discovered by a reasonable inspection; **(2) Fair** - Functioning less than optimally but safe and suitable and not in violation of the regulations; or **(3) Poor** - Not in compliance with the regulations. In any case N/A means - not applicable.

Boiler hydrostatically tested to _____psi, at a water temperature of _____degrees F.

Was boiler washed?_____

Were water gauge and valve passages cleaned?_____

Were gauge cock passages cleaned?_____

Were all washout plugs removed and inspected?_____

Were arch tubes, circulators, siphons and water bar tubes cleaned and inspected?_____

Thickness of arch tubes_____; Water bar tubes_____

Dry pipe thickness_____;Circulator thickness_____

Were water column passages cleaned and inspected?_____

Was boiler entered and inspected?_____

Were drilled flexible staybolt telltale holes tested?_____

Were staybolts hammer tested?_____

Were all broken staybolts replaced?_____

Were longitudinal lap seams inspected?_____

Was smoke box entered and inspected?_____

Safety relief valves pop at_____psi_____psi_____psi

Were injectors tested and in good condition?_____

Was feedwater pump tested and in good condition?_____

Were all steam gauges tested?_____

Were steam gauge siphon pipe(s) cleaned?_____

Were steam leaks repaired?_____

Were tubular water glasses renewed?_____

Were fusible plugs removed, cleaned & inspected?_____

Flexi caps removed on (date)_____

Were all air brake gauges tested?_____

Main reservoir hydro_____psi, hammer_____ NDE_____, Drilled_____

Were brake cylinders tested for leakage._____

Was main reservoir tested for leakage._____

Were air compressor(s) orifice tested?_____

Condition of driving gear._____

Condition of running gear._____

Condition of draft system and draw gear._____

Condition of spring/equalizing system._____

Condition of brake equipment._____

Condition of tender running gear._____

Was tender tank entered and inspected?_____

_____
INSPECTOR

_____
INSPECTOR

The above work has been performed and the report is approved._____
OFFICER IN CHARGE

Locomotive Air Brake Cleaning, Testing and Inspection Record

EQUIPMENT	SERVICE PERIOD	Previous Inspection	Current Annual Date	Inspection Date	Inspection Date	Inspection Date	Inspection Date	Notes
AIR COMPRESSOR ORIFICE TEST	92 service day							
AIR GAUGES	92 service day							
MAIN RESERVOIR LEAKAGE	92 service day							
BRAKE CYLINDER LEAKAGE	92 service day							
FILTERS	Annual Inspection							
DIRT COLLECTORS	Annual Inspection							
MAIN RESERVOIR HYDRO, HAMMER, NDE	Annual Inspection							
BRAKE VALVES	368 service days or second							

FRA Form 4

BOILER SPECIFICATION CARD

Locomotive No._____; **Boiler No.**_____; **Date built**_____
Boiler built by:_____
Owned by:_____
Operated by:_____
Type of boiler:_____; **Dome, where located:**_____

BOILER SURVEY DATA

Where **condition** is called for, use: **New** - New material at the time of the boiler survey; **Good** - Little or no wear and/or corrosion; **Fair** - Obvious wear and/or corrosion.

Boiler Shell Sheets

Material:	Type of Material (wrought iron, carbon steel, or alloy steel)	Carbon Content	Condition
1st course (front)	_____	_____	_____
2nd course	_____	_____	_____
3rd course	_____	_____	_____
Rivets	_____	n/a	n/a

Documentation of how material was determined shall be attached to this form.

Measurements:		At Seam	Thinnest		
Front flue sheet,	thickness	n/a	_____		
1st course,	thickness	_____,	_____,	ID_____	,ID_____
2nd course,	thickness	_____,	_____,	ID_____	,ID_____
3rd course,	thickness	_____,	_____,	ID_____	,ID_____

When courses are not cylindrical give ID at each end

Is boiler shell circular at all points?_____
If shell is flattened, state location and amount_____
Are all flattened areas of shell stayed adequately for the pressure allowed by this form?_____

Water Space at Mud Ring: Sides_____, Front_____, Back_____
Width of water space at sides of fire box measured at center line of boiler: Front_____, Back_____

Firebox and Wrapper Sheets

Firebox sheets:	Thickness	Material	Condition
Rear flue sheet	_____	_____	_____
Crown	_____	_____	_____
Sides	_____	_____	_____
Door	_____	_____	_____
Combustion chamber	_____	_____	_____
Inside throat	_____	_____	_____
Wrapper sheets:			
Throat	_____	_____	_____
Back head	_____	_____	_____
Roof	_____	_____	_____
Sides	_____	_____	_____

Steam Dome

Dome is made of _____pieces (not including seam welts, if any), Top opening diameter_____
Middle cylindrical portion - ID_____ , Opening in boiler shell, longitudinally - _____

Dome sheets:	Thickness	Material	Condition
Base	_____	_____	_____
Middle cylindrical portion	_____	_____	_____
Top	_____	_____	_____
Lid	_____	_____	_____
Boiler shell liner for steam dome opening:	_____	_____	_____

Is liner part of longitudinal seam?_____

Arch Tubes, Flues, Circulators, Thermic Siphons, Water Bar Tubes, Superheaters, and Dry Pipe

Arch tubes: OD_____, wall thickness_____; number _____; condition_____

Flues:
OD_____, wall thickness_____, length_____; number_____; condition_____
OD_____, wall thickness_____, length_____; number_____; condition_____
OD_____, wall thickness_____, length_____; number_____; condition_____

Circulators: OD_____, wall thickness_____; number _____; condition_____

Thermic siphons: number_____; plate thickness_____; condition_____
neck OD_____, neck thickness_____; condition_____

Water bar tubes: OD_____, wall thickness_____

Superheater units directly connected to boiler with no intervening valve:
Type_____, Tube OD_____, wall thickness_____; number_____; condition_____

Dry pipe subject to pressure:
OD_____, wall thickness_____, material_____; condition_____

Stay Bolts, Crown Bar Rivets, and Braces

Stay bolts:
Smallest crown stay diameter_____, avg. spacing_____X_____; condition_____
Smallest stay bolt diameter_____, avg. spacing_____X_____ ; condition_____
Smallest combustion chamber stay bolt dia._____,
avg. spacing_____X_____; condition_____

Measurement at smallest diameter

Crown bar bolts & rivets:
Roof sheet rivets, smallest dia._____, ave. spacing_____X_____; condition_____
Roof sheet bolts, smallest dia._____, ave. spacing_____X_____; condition_____
Crown sheet rivets, smallest dia._____, ave. spacing_____X_____; condition_____
Crown sheet bolts, smallest dia._____, ave. spacing_____X_____;condition_____

Braces:

	Number	Total Area Stayed	Total Cross Sectional Area of Braces Actual	Equivalent Direct Stay
Backhead	_____	_____	_____	_____
Throat sheet	_____	_____	_____	_____
Front tube sheet	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Safety Valves, Heating Surface, and Grate Area

Safety valves: Total number of safety valves on locomotive_____

Valve Size	Manufacturer	No. valves of this size and manufacture
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Heating Surface:
Heating surface, as part of a circulating system in contact on one side with water or wet steam being heated and on the other side with gas or refractory being cooled, shall be measured on the side receiving heat.

Firebox and Combustion Chamber	_____	square feet
Flue Sheets (less flue ID areas)	_____	square feet
Flues	_____	square feet
Circulators	_____	square feet
Arch Tubes	_____	square feet
Thermic Siphons	_____	square feet
Water Bar Tubes	_____	square feet
Superheaters (front end throttle only)	_____	square feet
Other	_____	square feet
Total Heating Surface	_____	square feet

Grate area:_____square feet

Water Level Indicators, Fusible Plugs, and Low Water Alarms

Height of lowest reading of gauge glasses above crown sheet:_____ _____

Height of lowest reading of gauge cocks above crown sheet:_____

Is boiler equipped with fusible plug(s)? _____, number_____

Is boiler equipped with low water alarm(s)? _____, number_____

Calculations

Staybolt stresses:

Stay bolt under greatest load, maximum stress _____psi
Location_____

Crown stay, crown bar rivet, or crown bar bolt under greatest load, max. stress _____psi
Location_____

Combustion chamber stay bolt under greatest load, maximum stress _____psi
Location_____

Braces:

Round or rectangular brace under greatest load, maximum stress _____psi
Location_____

Gusset brace under greatest load, maximum stress _____psi
Location_____

Shearing stress on rivets:

Greatest shear stress on rivets in longitudinal seam _____psi
Location (course #)_____ ; Seam Efficiency_____

Boiler shell plate tension:

Greatest tension on net section of plate in longitudinal seam _____psi
Location (course #)_____ ; Seam Efficiency_____

Boiler plate and components, minimum thickness required @ tensile strength:

Front tube sheet	_____@_____	Rear flue sheet	_____@_____
1st course at seam	_____@_____	1st course not at seam	_____@_____
2nd course at seam	_____@_____	2nd course not at seam	_____@_____
3rd course at seam	_____@_____	3rd course not at seam	_____@_____
Roof sheet	_____@_____	Crown sheet	_____@_____
Side wrapper sheets	_____@_____	Firebox side sheets	_____@_____
Back head	_____@_____	Door sheet	_____@_____
Throat sheet	_____@_____	Inside throat sheet	_____@_____
Combustion chamber	_____@_____	Dome, top	_____@_____
Dome, middle	_____@_____	Dome, base	_____@_____
Arch tubes	_____@_____	Dome, lid	_____@_____
Water bar tubes	_____@_____	Thermic siphons	_____@_____
Dry pipe	_____@_____	Circulators	_____@_____

Notes. **1.** **If tensile strength used is greater than 50,000 psi for steel or greater than 45,000 psi for wrought iron, supporting documentation must be furnished.**

2. **Any shell dimension less than 1/4" in thickness may not be adequate for support of or by other structures, particularly where threads or staybolts are concerned. Applicable codes should be consulted.**

Boiler Steam Generating Capacity: _____pounds per hour

The following may be used as a guide for estimating steaming capacity:

Pounds of Steam Per Hour Per Square Foot of Heating Surface:

Hand fired	8 lbs. per hr.
Stoker fired	10 lbs. per hr.
Oil, gas or pulverized fuel fired	14 lbs. per hr.

Record of Alterations

Description of Alteration	Date of Alteration

Record of Waivers

Waiver No.	Section No. Affected	Scope and Content of Waiver

Calculations done by:_____; Verified by:_____

Data used to verify the foregoing specifications is current and accurate. Based upon the information contained in this document and all necessary calculations, this boiler of Locomotive (Initial & number)_____ is safe for a working pressure of _____psi.

_____ Date_____; _____ Date_____

Locomotive Owner **Locomotive Operator**

Make working sketch here or attach drawing of longitudinal and circumferential seams used in shell of boiler, indicating on which courses used and give calculated efficiency of weakest longitudinal seam.

Form No. 5 **Locomotive Service Day Record**

Locomotive Initial and No._____ **owned by** _____ **and operated by**_____was placed in service following a 1472 Service Day Inspection on (start date)_____.
This locomotive shall not be operated after (date)_____, or it shall not be operated after it has accumulated 1472 service days from the above start date, whichever comes first, at which time it shall be due for a 1472 Service Day Inspection.

	Year															
Serv. days since last insp.																
Annual Date																
Serv. days since last insp.																
31 Service Day Date																
Serv. days since last insp.																
31 Service Day Date																
Serv. days since last insp.																
92 Service Day Date																
Serv. days since last insp.																
31 Service Day Date																
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Serv. days since last insp.																
31 Service Day Date																
Serv. days since last insp.																
31 Service Day Date																
Serv. days since last insp.																
Annual Date																
TOTAL																

A copy of this record shall be filed with the Regional Administrator after 31 December and prior to 31 January of each year.

Signed_____**Officerin Charge**

FRA Form 19

Report of
ALTERATION ☐
or
Welded or Riveted REPAIR ☐

Locomotive Initials_____ **Locomotive No.**_____; **Boiler No.**_____;

Owned by _____

Operated by _____

Date work completed_____

Description of work:_____

Stress Calculations:

Remarks:_____

Attach drawings used in the repair or alteration or make drawings on back of this form.

Work done by:_____;

Certified by:_____

[64 FR 62865, Nov. 17, 1999, as amended at 70 FR 41996, July 21, 2005]

APPENDIX D TO PART 230—CIVIL PENALTY SCHEDULE