Condition Assessment Manual

Generator Inspection Form and Checklist

Revision 1.1, 12/15/2011

Prepared by
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831-6283
managed by
UT-BATTELLE, LLC
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-00OR22725

and

MESA ASSOCIATES, INC.
Chattanooga, TN 37402

Generator – Inspection Form

General Information:

Date of Site Visit: _____ Unit No._____

Plant name: _____

Source/s of data:_____

Manufacturer: _____Age:_____

Turbine Rated Output (MW):_____Max. Turbine Output (MW):_____Rated Speed (rpm):_____

General Generator
Description:_____
_____
_____
_____

Summary Failure History/Maintenance History / Major Repairs Description:
_____
_____
_____
_____
_____
_____

Typical Operating Mode:_____

Stator

Rating:_____@_____pf

Voltage: _____ Current Insulation Class:_____

Winding Age:_____ Last Rewedge:_____

Winding Description (pitch, span, circuits, turns/coil, etc.): _____

_____

Installed
Instrumentation/Monitoring:_____
_____

Rotor

Insulation Class:_____ No. Poles:_____

Type Construction:_____

Excitation Requirements:_____

Installed
Instrumentation/Monitoring:_____

Addition specification data:

_____
_____
_____
_____
_____

Cooling System:

General Description of Stator /Rotor Cooling System:

_____
_____

Modifications:_____

No. of Air Housing Coolers:_____

Cooler Tube Material:_____ Cooler Design Data (flow rate, water temp, temp rise):

_____

Temperature Control Method:_____

Addition specification data:

_____
_____
_____
_____

Neutral Grounding:

Neutral Ground Method (i.e., high impedance, low impedance, resistance, etc.):

_____
_____

Neutral Beaker:_____ Neutral Disconnect:_____

Ratings:_____

Oil Filled Components:_____

Addition specification data:

_____
_____
_____
_____

Thrust Bearings:

Type/LocationMaterial: _____

Installed Instrumentation/Monitoring:_____

Cooling Description:_____

Addition specification data:

_____
_____
_____
_____

Guide Bearing(s):

Type/LocationMaterial: _____

Installed Instrumentation/Monitoring:_____

Cooling Description:_____

Addition specification data:

_____
_____
_____
_____

Generator Shaft:

Fabrication Description/ Material: _____

Vibration Monitoring System
Description:_____

Vibration Alarm Point(s):_____Trip Point:_____

Addition specification data:

_____
_____
_____
_____

Generator Check List				
Topic	**Yes**	**No**	**N/A**	**Comments/Details**
Maintenance & Major Repair History				
Stator Coil Replacement/Repair				
Coils Jumpered/Cut out				
Stator Rewedge - Complete				
Stator Rewedge - Partial				
Loose winding blocking/bracing/lashings/spacer repairs.				
Core Replacement				
Core Repairs				
Core Tightening				
Have all plant records regarding stator maintenance, repairs, operating conditions and performance data been requested/gathered?				

Generator Check List - Continued				
Topic	**Yes**	**No**	**N/A**	**Comments/Details**
Maintenance & Major Repair History - Continued				
Have there been hi-pot test failures?				
Have there been any out-of phase synchronizing events?				
Has there been any inadvertent energization at standstill?				
Rotor Rewinds?				
Shorted Turn Repairs, pole or lead connection issues?				
Amortisseur winding issues/repairs?				
Rotor or Stator Roundness Issues?				
Field Grounds?				

Generator Check List - Continued				
Topic	**Yes**	**No**	**N/A**	**Comments/Details**
Maintenance & Major Repair History - Continued				
Other Stator / Rotor Failures/Repairs Not Included Above				
Neutral Transformer/Reactor/Resistor Issues or Replacements				
Neutral Breaker/Disconnect Issues or Replacements				
Air Housing Cooler Tube Leak Repairs/Plugged Tubes				
Air Housing Cooler Replacements				

Generator Check List - Continued

Topic	Yes	No	N/A	Comments/Details
Equipment Condition Assessment				
Do current electrical visual inspection results show evidence of winding looseness, hot spots, corona, wedge or filler migration, vent duct or finger plate, foreign object or mechanical damage, oil and or dirt contamination?				
Do electrical rotor and stator test result trends indicate marginal insulation integrity?				
Do stator or rotor bridge measurements show deterioration?				
Does on-line temperature information indicate any stator or rotor overheating?				
Cooler Tubes Air Side Fouled / Water Side Plugged/Mechanical Damage or Fin/Baffle Separation				
Cooler RCW System Temperature Controller Fully Functional				

Topic	Yes	No	N/A	Comments/Details
Maintenance & Major Repair History - Continued				
Thrust Bearing Failures/Replacements				
Guide Bearing Failures/Replacements				
Bearing Oil Cooler Failures/Replacements				
Generator Shaft Repairs or Modifications				

Generator Check List - Continued				
Topic	**Yes**	**No**	**N/A**	**Comments/Details**
Equipment Condition Assessment – Continued				
Rated capacity from RCW supply pumps				
Availability of spare cooling system long lead components				
Operational bearing/oil overtemperature				
Thrust Bearing Babbitt issues (babbitt)bond, electrolysis, scoring				
Bearing oil cooler periodically inpected and tested				
Neutral Grounding visual assessment				

Generator Data Collection Sheet	
Topic	**Data Input**

For overall questions
please contact:

Brennan T. Smith, Ph.D., P.E.
Water Power Program Manager
Oak Ridge National Laboratory
865-241-5160
smithbt@ornl.gov

or

Qin Fen (Katherine) Zhang, Ph. D., P.E.
Hydropower Engineer
Oak Ridge National Laboratory
865-576-2921
zhangq1@ornl.gov