



INSPECTION / TEST METHOD COMPARISON TABLE FOR “REFORMER” TUBE INSPECTION / TESTING

	LOTIS	EDDY CURRENT (ET)	ULTASONICS (UT)
Capable of providing 3-Dimensional (3D) modeling of entire reformer tube network to assist in identification of Burner or Tunnel problems	YES , Quest TruTec's custom reformer software allows 3D modeling of reformer tubes to assist in overall maintenance.	NO , All that is provided is tube retirement results. No problems with burners or tunnel regions are identified.	NO , All that is provided is tube retirement results. No problems with burners or tunnel regions are identified.
Can detect “early” stages of creep expansion <u>before</u> internal cracking (fissuring) occurs	YES , Capable of detecting expansion down to 0.1% growth. This % of creep strain happens well before fissuring occurs.	NO , Fissuring must be occurring before ET will detect any change. Generally, this is at 1% - 2% growth.	NO , Fissuring must be occurring before UT will detect any change. Generally, this is at 1% - 2% growth.
Accuracy	+/- 0.002” Int., +/- 0.005 Ext.	+/- 5% Tube Wall Thickness	+/- 0.020”
Inspection / test is effected by external rough “as cast” surface	NO	YES , The external surface caused noise to be induced into the data creating a larger margin of error in the test results.	YES , The external surface caused noise to be induced into the data creating a larger margin of error in the test results.
Inspection / test covers 100% of the tube’s <u>Axial</u> length	Internal LOTIS = YES External LOTIS Crawler = Limited to the fired region of the tube within the reformer box.	NO , Limited to only the region of the tube that is exposed in the fire box. Tube in the lower coffin area will also be skipped.	NO , limited to only the region of the tube that is exposed in the fire box. Tube in the lower coffin area will also be skipped.
Inspection / test covers 100% of the tube’s <u>Circumferential</u> surface	YES	NO , Only a small portion (~60%) of the tubes circumferential surface is tested.	NO , Only a small portion (~60%) of the tubes circumferential surface is tested.
Inspection / test is Effected by Tube Bowing	Internal LOTIS = NO External LOTIS Crawler = Yes	YES , The external crawlers cannot climb the tube if it is bowed enough to limit spacing between adjacent tubes	YES , the external crawlers cannot climb the tube if it is bowed enough to limit spacing between adjacent tubes
Oxide Shedding on the tubes exterior effects Inspection / Test Results	NO	YES , Oxide shedding will be averaged into the overall tube wall loss which will over exaggerate the damage.	YES , Oxide shedding will be averaged into the overall tube wall loss, which will over exaggerate the damage.
Inspection / Test Speed	~3 Minutes per Tube	~6 Minutes Per Tube	~5 Minutes Per Tube
Requires a coupling medium (i.e. water)	NO	NO	YES , Requires the use of water or gel as a coupling medium on the tubes exterior in order to perform the exam. Water damages floor refractory at the base of the reformer.