

INSPECTION PROCEDURES

- 2.11 The test equipment should be set up in a way that is most advantageous to the analyst viewing. All appropriate cords, cables and probes should be connected. The test probe should be loaded by the test object. (Follow equipment manufactures set up procedures). The test equipment should be turned on, balanced/nulled and placed in a stand by mode to allow for equipment warm up.
- 2.12 Check machine information, serial number, model, chiller number. Review any past eddy current reports supplied by JRClark Services, analyst's personal records, contractor's records or end customer's records.
- 2.13 Fill out Vessel Data sheet. All appropriate information should be filled in. Job Site and address should be checked for accuracy.
- 2.14 Start Carrier Location Sheet (Carrier jobs). In upper left corner fill in job location/name and page number. The upper right corner, JRClark Services, our phone number and analyst name. Note the date, job location, equipment manufacturer, model number and serial number. Note the vessel being tested, the end viewed from and tube/row information. The calibration and start time should be noted upon calibration completion. All defects will be noted by row and tube number. A description of the defect to include size in divisions and fifths of divisions and area of the defect will be noted. Skip fin tubes indicating wear at support or freeze damage in the land area will also be noted in thousandths of an inch. If more than one defect is found in a tube, only the most serious defect will be noted. Tubes indicating missed expansion, missing land, not expanded or misformed land will be noted in the Carrier cover letter and are not recorded in the Report of Eddy Current Inspection. Previously plugged tubes are to be listed on the location sheet. Calibration will be checked once an hour or whenever improper function of the test equipment is suspected. The row and tube number will be noted at each calibration. If improper function occurs re-calibrate and re-examine all tubes examined since last calibration. When a vessel is finished calibration will be checked and the finish time noted. Repeat this procedure until all vessels are completed.
- 2.15 Draw tube diagram. The diagram is the test end view of the tube bundle. It must be carefully drawn to represent the true tube layout. Tubes indicating defects must be marked with a symbol. A legend will be provided indicating each symbol's meaning. An exception is when minor damage is noted in a majority of tubes. This should be noted in the Report of the Eddy Current Inspection recommendation section.

- 2.16 The test equipment will be calibrated to the type of tube being tested. A machined calibration standard will be used for this procedure. The calibration standard will have artificial defects that relate to defects normally encountered. The test instrument is calibrated at the beginning of the test. Calibration is checked once an hour during operation. Re-calibration is performed if any of the following change: probe, frequency, gain, phase, tube size or material. Calibration is checked if improper function is suspected. If improper function occurs, re-calibrate and re-examine all tubes examined since last calibration.
- 2.17 Calibrate the strip chart recorder and run a calibration strip chart. Retain this strip chart for insertion in the Report of Eddy Current Inspection.
- 2.18 The analysts will test all tubes in the bundle unless otherwise noted on the job bid form. The test probe is inserted the length of each tube in the bundle. The probe is withdrawn at a constant rate of speed not to exceed sixty feet per minute. The probe's ideal fill factor is 70% or more. The minimum fill factor not less than 50%. Defects will be recorded on the tube diagram as they are encountered. Defects will also be noted on the location sheet as they are encountered, for Carrier jobs.
- 2.19 After all tubes are tested select the tubes to be strip charted. If no measurable defects are noted, at least six strip charts should be run. These strip charts should be in a pattern of a cross section of the bundle. If defects are noted at least one typical tube must be strip charted. Measured distance between end and support sheets will be marked on the typical tube strip chart. At least one of each type and size defect must be strip charted. The major defects should be referenced to the nearest support sheet. All strip charts will be marked with the proper row and tube number. The strip charts will be retained for inclusion in the Report of Eddy Current Inspection.
- 2.20 The inspection procedure will be repeated for each vessel inspected. Insure that all information on the vessel data sheet is filled in. Retain vessel data sheet, location sheet (Carrier job), all tube diagrams and strip charts for insertion in the Report of Eddy Current Inspection.