INSPECTION OF ELECTRICAL SWITCHGEAR & COMPACT DISTRIBUTION SUBSTATIONS
WORK INSTRUCTION
UIS-I-45

Introduction:

This work instruction is applicable for the pre shipping inspection of medium voltage switchgear & compact sub stations.

An inspection program (Inspection Test Plan) should be agreed upon prior to starting of inspection & loading with the supplier's representative.

Hereafter an outline of main inspection steps, which can be followed to conduct a normal inspection of Compact Substation.

1 Documents Review &Opening meeting

1.1 Review and abide by all safety instructions pertaining to all activities of production, testing and loading of switchgear and or distribution compact sub stations components at all relevant locations including the inspection location, loading…etc.

1.2 Review of inspector assignment and relevant documents (Contract, Purchase Order, L/C, Performa Invoice, and Technical Specifications / standards and any special requirements).

1.3 An opening meeting is to be held with the supplier representative at the inspection site in order to review together the documents needed and to discuss the inspection plan and to request any assistance, if necessary.

1.4 Inspector is to acquire main points regarding quality aspects & standards applied for production and testing of switchgear and/or substation parts or their components subject to inspection. General drawing of this equipment may be requested for easy referencing (if available).

1.5 Check test result records of routine tests by quality control personnel at production facilities on each batch or lot of equipment, and any other tests that may have been conducted by other party including type tests.

1.6 Review records and certificates for calibration of the instruments & devices to be used for testing to assure their accuracy.

2. Visual and Dimensional Inspection

2.1 Inspector shall visually examine the components of the switchgear , and check the appearance, newness, and physical check if there is any defects; such as rust or damage, oil leakage, broken or cracked bushing….etc (photos should be taken to verify extent of defects clearly)

2.2 Check for availability of proper handling & lifting fixtures.

2.3 Representative samples should be checked for simple dimensional & key functions (indication of quality), see item 3.

3. Sampling & Testing (witnessing of tests if included in contract requirements of principle appointing UIS as Third Party Inspection Company)

3.1 Random sampling of switchgear or compact substation lots shall be conducted according to UIS procedure (UIS-P-10).

3.2 Check of and recording of name plate data, this includes verification of some requirements of buyer such as year of manufacture, origin, ambient temperature of environment in which the equipment would be installed, nominal voltage…etc. Verify these data against requirements.

3.3 According to most international standards the following tests or checks are usually routinely carried out at manufacturing facility:

- Check of conformity of auxiliary & control circuits as well as check for proper mounting of auxiliary circuits & relays.

- Check for proper routing of wiring & cabling, proper identification of wiring terminals.

- Bus bars, bushing, CT's & VT's are to be checked for tightness and over all quality of assembly.
- Visual inspection of actuators, interlocks, earthling switch…etc.
- High Voltage Test - Insulation Test.

- Functional Tests of all low voltage circuits, shall be made to verify the proper functioning of auxiliary and control circuits.

- Verification of protection against electric shock.

3.4 The results of tests carried out or witnessed should be checked to determine conformity with requirements & contract conditions. If a certain degree of non-conformity is detected, the technical department should be immediately informed and change of sampling plan and QAL maybe required according to UIS procedures and/or relevant international standards.

4. Packaging and Loading:

4.1 The inspector shall follow UIS common practice to supervise loading and sealing of container, observation of safety procedure is of vital importance.

4.2 The inspector shall make sure that packaging and stuffing of this electric type of equipment is suitable and gives adequate protection during transporting and handling.

4.3 Usually medium voltage sub stations & switchgear should be properly packaged & wrapped in insulating nylon film and strapped on strong wooden pallets or put inside strong wooden boxes, then stuffed into containers and properly lashed to prevent movement of packages during transportation.

4.4 The inspector should check for the availability of Operation & Maintenance manuals, spare part ref. …etc.

5. Reporting to Technical Department

5.1 Daily reporting directly to Technical Department shall be made by the inspector on UIS-F-29 form each day of the inspection period, and should cover the day's inspection activities including progress of inspection, non-conformities and any other remarks.

5.2 Upon completion of any given inspection, final inspection reports should be forwarded to the Technical Department by fax or email, as soon as possible but not later than (24) hours of inspection completion, together with the packing list, calibration certificates and any other document, signed, stamped and dated by the inspector.