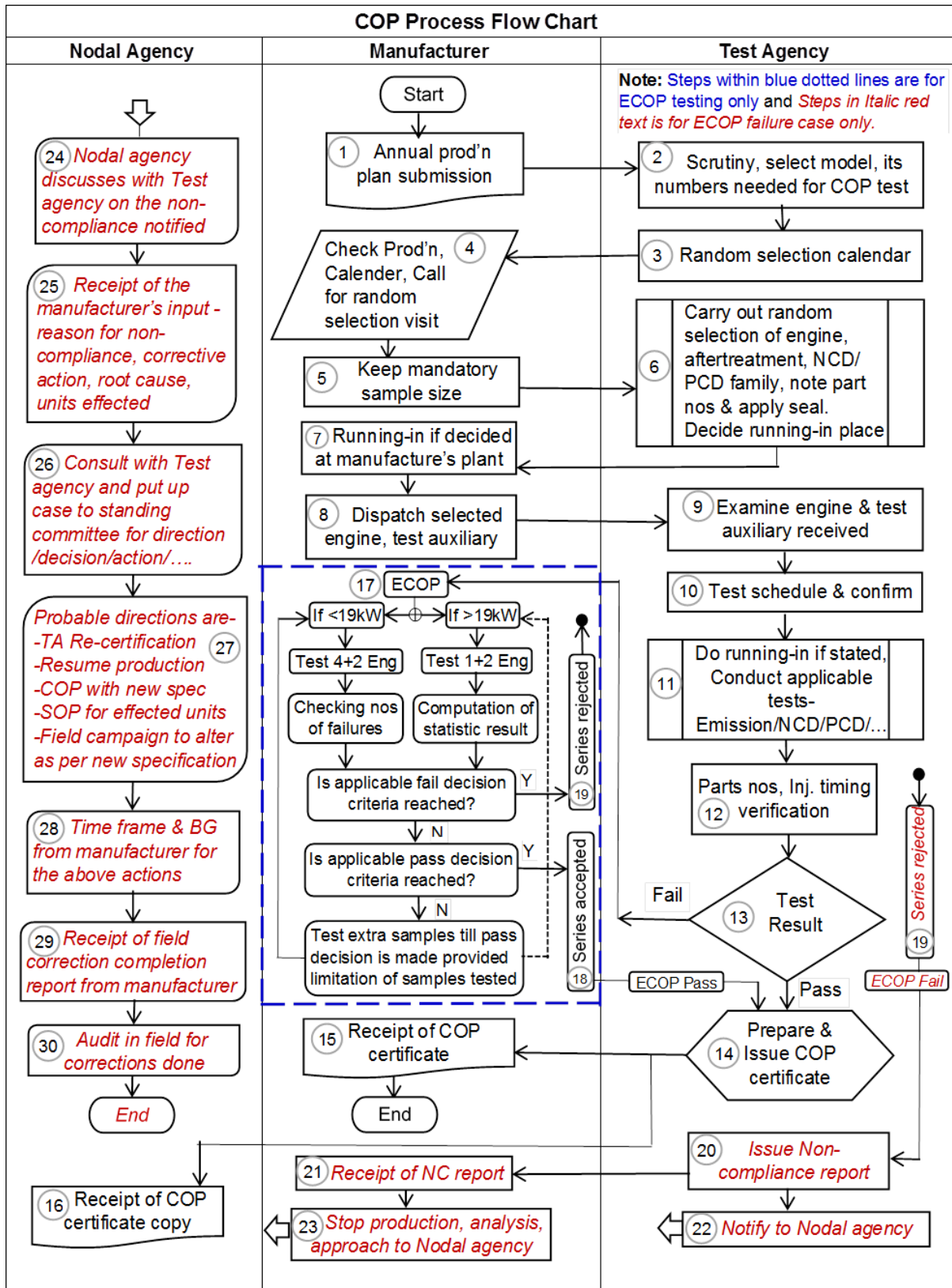


COP Process Flow Chart



Following are the logical steps for the COP process flow chart described in brief stepwise-

COP cycle shall end with either -

- I. COP compliance with regular sample testing (Steps 1-16)
- II. COP compliance with extended samples testing (.... Steps 17-18)
- III. COP non-compliance after extended testing (.... Steps 19-30)

CASE I:

1. Manufacturer with valid Type Approval and COP certification submits annual estimated production/import volume data to technical agency involved in the format provided within two months of start of new COP-year.
2. Technical agency, based on the production/import volumes, communicates to manufacturer, the engine type chosen and the number of samples needed for COP compliance test for all engine families of that manufacturer within one month of submission of above production volume data;
3. Technical agency also communicates to the manufacturer plan for COP engine random selection based on manufacture's input above;
4. Manufacturer coordinates adhering to technical agency provided or negotiated plan and coordinates for engine random selection at manufacturing plants/warehouses/sales points for imported engines as the case may be.
5. At the point of selection as mentioned in Sr 4, manufacturer provides with minimum required sample size for random selection;
6. Technical agency representative carries out random selection and does note emission critical component part and serial numbers. Provides with appropriate seal for avoiding tampering of assembly parameters further;
Technical agency representative randomly selects after treatment system if applicable;
Technical agency representative can also carry out random selection of an engine if from chosen representative engine family for NCD, PCD compliance utilizing the same pool of engines offered;
7. Decision, if running-in is carried out at manufacturer's location or technical agency location;
If running-in is agreed to be carried out at manufacture's facility, running-in shall be started in presence of technical agency representative.
8. Engine along with arranged after treatment shall be transported to technical agency test location;
9. Upon receipt of engine along with auxiliaries, technical agency examines the adaptability in test cell, make necessary modification in exhaust line, mounts, etc, if required.
10. Technical agency communicates the test schedule to manufacture for his witness
11. Technical agency carries out engine qualification and emissions test per applicable procedure and shares results with manufacturer;
12. Technical agency carries out critical component type/part numbers, injection timing verification and match with type approved document, in case any change noted, manufacturer to provide the declaration in this regard, till time COP certificate will be on hold.
13. Review of test result & decision on compliance;
14. If COP compliance is obtained, Technical agency prepared the compliance certificate within 4 weeks from the date of testing. Engine & after treatment, test auxiliary is returned to the manufacturer;
15. Technical agency issue compliance certificate to manufacturer
16. Technical agency forwards a copy of compliance certificate to Nodal agency

CASE II:

17. **ECOP:** If non-compliance observed after testing (at Stage No 13), process begins from extended random selection of engine(s) as per preferred options prescribed in clause 5.3.20.
- **ECOP > 19KW (Statistics is on the basis of failed emission values)**
 - 17.1 Initially test 2 more new engines
 - 17.2 Computation of the test statistic result of 3 engines (1-originally tested + 2 new)
 - a) According to the appropriate clause does the test statistic result agree with the criteria for failing the series
 - b) According to the appropriate clause does the test statistic result agree with the criteria for passing the series
 - 17.3 If, answers of a & b are NO, then; continue the testing on additional samples till pass decision is made provided limitation of samples tested as applicable (10 numbers maximum)
 - **ECOP < 19KW (Statistics is on the basis of numbers of failed engine)**
 - 17.4 For establishing the compliance minimum 4 samples are mandatory to be tested and all 4 samples should pass.
 - 17.5 If some samples failed, the additional new more samples, are required to be tested, the numbers depend on the number of samples failed earlier,
 - 17.6 Initially test 2 more new engines
 - 17.7 In the cumulative samples (4-originally tested + 2 new), note the numbers of failed samples
 - c) According to the appropriate clause does the number of failed samples agree with the criteria for failing the series
 - d) According to the appropriate clause does the number of failed samples agree with the criteria for passing the series
 - 17.8 If, answers of a & b are NO, then; continue the testing on additional samples till pass decision is made provided limitation of samples tested as applicable (30 numbers)
18. If during testing if the pass decision criteria is reached, the series is deemed to be compliance and COP certificate is issued (then continue from Stage14-16)

CASE III:

19. If during testing if the fail decision criteria is reached, the series is deemed to be non-compliance;
Or if Manufacturer opts to declare non-compliance without availing total number of samples allowed to be tested, the series is deemed to be non-compliance
20. Technical agency prepares the COP failure report
21. Technical agency issue COP failure report to manufacturer
22. Technical agency informs nodal agency about COP non-compliance of said engine family
23. Manufacturer stops production or import of the said non-compliant engine family;
Manufacturer informs nodal agency about non-conformity, stoppage of production and dispatch and their plan for failure investigation within 4 weeks of receipt of COP verification report or COP failure intimation
24. Nodal agency discusses with test agency in details on the non-compliance notified.

25. Nodal agency replies to the manufacturer about their inputs on timelines by which compliance shall be obtained as well as failure root cause and corrective action plan submission. Nodal agency also informs about any financial penalty or assurance required from the manufacturer;
Manufacturer submits root cause analysis and corrective action plans to nodal agency in consultation with technical agency;
26. Nodal agency in consultation with technical agency reviews manufacture's submissions and decides if such case shall be put forth for standing committee review and guidance if found necessary depending upon the severity of the failure.
If decided to represent at standing committee, nodal agency brings this issue to standing committee and allows manufacture to represent their submissions. If standing committee agrees / approves manufacturer's submission and plan then;
27. Nodal Agency can also decide on their own & shall take following decision:
 - 27.1 Gives written permission to technical agency to proceed with re-verification of COP with improvements implemented by manufacturer and also type approval re-certification as the case may be.
 - 27.2 Manufacturer offers engine sample and technical documentation to technical agency and complies with COP;
 - 27.3 Technical agency issues compliance certificate or type approval certificate if newly approved as an option;
 - 27.4 Manufacture begins production after obtaining new Type Approval or COP compliance certificate;
 - 27.5 Manufacturer completes corrective actions on engines dispatched during period of COP and COP failure date;
28. Manufacturer complies with 'financial assurance related' documents asked by Nodal Agency;
29. Manufacturer submits corrective action / campaign report with adequate evidences to Nodal Agency
30. Nodal Agency with help from Technical agency audits compliance in field for corrections done and issues closure letter to manufacturer;

End