Alpha
Consulting Engineers Pte Ltd

FEEDBACK REPORT FORM

Ref No: 126 - 080310 (S)

To: LCT From: LFY

Job No./Project: ELECTRICAL MASTER SPECS *(where applicable)*
Section 10 – Standby Generator

Source of feedback:

Scope of Feedback: * ☐ Quality ☐ Environmental ☐ Administrative ☐ Contractual ☐ Technical ☑ Specification ☐ Others

Section A : Problem & Cause Specifications on standby genset did not stipulate requirements for contractor to submit certificate of origin and warranty certificate for engine and alternator. Also did not stipulate requirements to submit calculations wrt sizing of capacity of standby generator for starting motor, vibration isolators, battery sizing and exhaust silencer

Section B : Mitigating Action Taken, if any

Section C : Suggested Corrective Action
~~Apo~~ Requirements added.

Section D : Approved Corrective Action

Document Affected * : ☑ Yes ☐ No Affected Document : E/10-14 to E/10-15

Approved By : Date : 3/3

Section E : Action

Action By : NA

Targeted Completion : March 2010

Actual Completion : 3/3/10 Verified By :

* *Mark [X] where appropriate*

Distribution:

* when the inner tank is partially or completely full and the ground water table is below the tank bottom

* when the inner tank is partially or completely full and the tank is partially or completely submerged in groundwater

The leak detection performance of the monitoring system shall be tested and to detect leaks as small as 0.45 litre per hour with a 95% probability of deduction and less than a 5% probability of a false alarm. All monitoring equipment including FRP reservoir and electronics control shall be U.L. listed.

The FRP must be installed strictly in accordance with the manufacturer's instruction and leak tests as recommended by manufacturer are to be carried out prior to site installation.

Select clause 10.23 if parallel operation of two or more generators is required.
01/02/98

10.23 Synchronising & Parallel Operation

Generators which are required to be operated in parallel are as shown in the Specification Drawings and or indicated in the Schedule of Technical Requirements. The synchronising equipment shall be suitable for both the manual and automatic synchronising of the generators and shall be equipped with the following functions and instrumentation:

- Start/Stop of each generator set.

- Complete synchronising.

- Regulation of active and reactive load.

- Supervision and/or limiting active and reactive load.

- Set selection for start/stop duty cycle operation.

- Manual adjustment control for voltage and frequency outputs for each generator set.

- Synchroscope and/or synchronising lamps for manual synchronising.

- Instrumentation meters such as Voltmeters, frequency meter, kilowatt meter, kilovar meter, power factor meter, field current ammeter for each generator set.

- Reverse power relay for each generator set to disconnect the set from the load before reverse power reaches 10% of set rating.

The generator sets for parallel operation shall have compatible matched engine governors to give similar speed droop characteristics and quadrature droop current transformers for reactive load sharing. The whole system must ensure equal active and reactive load sharing for generator sets with similar ratings and for generator sets with dissimilar ratings, the sharing of active and reactive loads must be proportional to their respective ratings.

10.24 Submissions and Calculations

The Sub-Contractor shall submit the original copy of the Certificate of Origin and warranty certificate from the engine and alternator manufacturer. The serial number of the equipment, its country of manufacture and the year of manufacture shall be clearly indicated on the certificates.

Submit calculations to substantiate that the capacity of the selected generator is of sufficient capacity to withstand the starting kVA of the motor loads connected to the generator with the resulting voltage dip of the alternator limited to not more than 20% of its terminal voltage.

Submit calculations to substantiate the selection of the type, rating and quantity of vibration isolators provided. The calculations must utilise the method of bending moments and the combined centre of gravity of the engine and alternator to determine the positions of the isolators.

Submit calculations to substantiate that the capacity (amphere-hour rating) of the battery is sufficient to provide at least six successive starts to start the engine without recharging.

Submit calculations to substantiate the selection of the exhaust silencer and sound attenuators to achieve the specified noise level at 1 metre from the generator room or acoustic enclosure under free field conditions.