

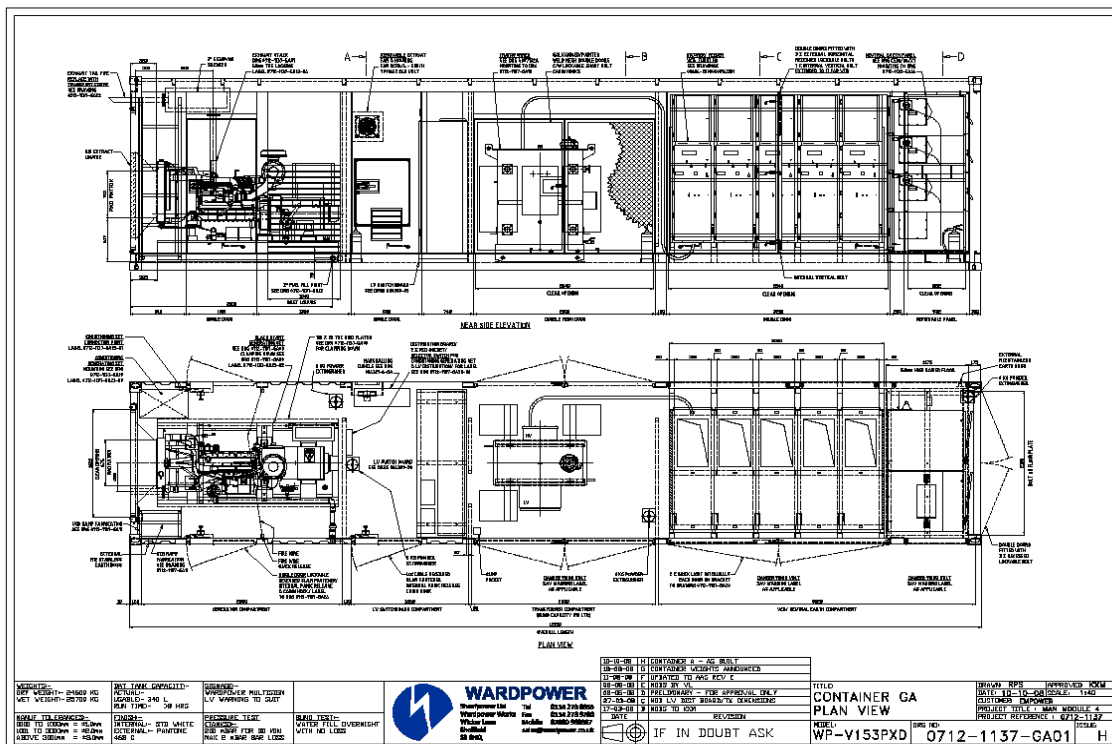


Case Study: Empower Transportable Power Plant

2008 presented a new opportunity for **WARDPOWER** to demonstrate the breadth of their skill base with a venture into the world of switchgear modules and Heavy Fuel Oil transportable emergency power stations...

In late 2007 **WARDPOWER** were approached to become involved in a major project to supply 15MWe HFO transportable power stations all over Africa. Their original design brief was to provide a suitable containerised module to provide LV power distribution and emergency power to start up the ancillaries of the power stations' 11kV HFO Medium Speed Generators and their associated HFO/LFO fuel systems and other supporting equipment. This brief quickly grew, however, to including the HV generation distribution equipment and the complete LV and HV power system design for the station as a whole, including synchronising, protection and neutral earthing.

Working closely with the Consultant, a comprehensive design was developed for a module containing a 150kVA black start generating set with an additional 2.2KVA "conditioning" generator in case of total black out, an LV switchboard with synchronising facilities, a marshalling cubicle, an 11kV/400V 750kVA step down oil cooled transformer, a 5 panel 11kV switchboard and a 3 circuit Neutral Earthing Resistor panel. All of that to go in a 40' shipping container capable of being shipped anywhere in the world as conventional container cargo and made operational within 1h of being put on the ground to provide power to allow the power station itself to be erected.



Yes of Course it will all Fit.....just!

With the clearances for some of the equipment as low as 20mm, for some of the equipment, even getting in the box was an exercise in ingenuity!

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This was a real “live-it” project: The team were asked to take on from the very beginning that these units would be used in the most isolated communities where popping out for a spare was not going to be an option: They had to be sure that they were reliable, well thought through, useable pieces of equipment with every detail considered. The installation supervisor in particular had been included in the design process from the beginning as the man who would have to get all three quarts of equipment in to the 40ft container pint pot and also as the man with the best understanding of what a client working on these units in the middle of the night would have to contend with: Suddenly those domestic electrics took on a whole new significance!



All the Content as Well as the Wrapping
*An 11KV synchronising Switchboard complete with comprehensive protection suite, designed as a part of the **WARDPOWER** HV scheme design.*

The design process identified a host of issues to be resolved from false floors to accommodate cable bending radii, removable panels in container walls and ramps to allow removal of withdrawable circuit breakers, to fixing/bracing of equipment for sea freight. All electrical and mechanical design work was done in house and all procured equipment was subject to a rigorous approval process to prevent any ‘surprises’ at the end. All the equipment was factory tested at its place of manufacture and each complete container was then fully commissioned as a system by the commissioning team led by **WARDPOWER’s** lead electrical engineer. This included full cable checks/tests, LV and HV, functional testing of the 11kV switchboard and MiCOM relays and functional testing of the NER panel, generating sets and LV board. Finally the incoming and outgoing signals were proven to the Client at the marshalling cubicle before the first unit went off for successful system tests of the first complete 15MWe power station in Colchester.

Project in Brief:

- Full design and protection study at LV and MV.
- 5 panel indoor 11kV Switchboard with MiCOM protection relays
- 3 circuit 11kV Neutral Earthing Panel
- 11kV/400V step down transformer
- 150kVA generating set with 2.2KVA back up “conditioning” supply
- LV synchronising switchboard and marshalling cubicle
- Mechanical design to ensure secure sea freight and compact design
- Full testing and commissioning of every aspect of the containerised plant



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