



22 August 2022

UNIDO CLARIFICATION Note No. 1

Request for Proposal (RFP) No.: 1100177111

**PROVISION OF ONE BRAND NEW MOBILE INSULATING OIL
REGENERATION PLANT (Lot 1)
AND TWO BRAND NEW MOBILE INSULATING OIL
FILTRATION/DEHYDRATION PLANTS (Lot 2)
FOR TRANSFORMERS AND WITCHEARS FOR USE BY CEYLON ELECTRICITY BOARD IN
SRI LANKA**

Questions	Answers
1. In the tender it specified that ISO 9001 or similar Quality Assurance certification (pg.15&16) is a requirement for this bid. How crucial is this requirement to participate in this bid? . Could an extensive customer reference list for supplying Transformer Oil Regeneration Plants through many years be an equivalent proof?	If a Vendor does not have the ISO 9001 or similar Quality Assurance certification, the bid must include the details of the Quality Assurance and Quality Control applied in the design and construction of the equipment. In addition, the Vendor must specify the standard applied (i.e. ASTM) in the design and construction of Transformer Oil Regeneration Plants or parts thereof. References must be provided to demonstrate customer satisfaction of services provided.
2. Please confirm what are the expected payment terms since we did not see any mention of this?	The schedule of the payment will be decided during the contract preparation stage and will be based on the findings from the evaluation process. Please note, however, that UNIDO does not apply advance payments unless a Performance Bank Guarantee for the same amount is received.
3. Regen General Section 5.1.1 (Pg 6)- It states that the Regen System must be housed in a Nema 4 Enclosure? It is our intention to supply our System in approximately a 30ft long semi trailer. This trailer will have air intake vents and ventilation fans so it cannot be considered a Nema 4 enclosure. It will have the means to be sealed up when not in use and is a weatherproofed system while in operation. The operator will operate, monitor and maintain the system from inside the trailer. The specification seems to imply that the operator will operate and do maintenance from outside of the trailer via flip up doors? Please clarify	<u>Response related to Mobile Insulating Oil Regeneration Plant:</u> The different components such as tanks, pipes, shall be built meeting acceptable industrial standards such as ASTM and assembled on an appropriate size flat bed or in a semitrailer. The Mobile Insulating Oil Regeneration Plant shall be mounted on an appropriate size semi-trailer with single or double-axle to meet the local regulatory transportation requirements. Electrical wiring and control panels shall be protected from rain and other sources of water using appropriate and acceptable enclosures such as NEMA 4 standard. The operator shall operate the transformer oil regeneration system from inside the trailer.

	<p><u>Response related to Mobile Insulating Oil Filtration/Dehydration Plants:</u></p> <p>The different components such as tanks, pipes, shall be built meeting acceptable industrial standards such as ASTM and assembled in an appropriate NEMA 4 enclosure.</p> <p>The Mobile Insulating Oil Filtration/Dehydration Plant shall be mounted on an appropriate size flat bed or semi-trailer with single or double-axle to meet the local regulatory transportation requirements.</p> <p>The operation and maintenance work on the transformer oil filtration/dehydration plant could be carried out from outside the trailer plant.</p>				
<p>4. Regen Design Section 5.1.2 (Page 7); It states that the system shall use a non migratory type filter to remove dissolved water and that no use of external heat or vacuum will be used to complete the dehydration process and that this filter must be able to process 150,000 KGS of contaminated oil.</p> <p>This requirement seems to be a mistake and runs contrary to other requirements within the specification (Section 5.1.14.2 specifies the vacuum pump motor?). This is not technically feasible nor would it be economically practical even if a filter was capable of accomplishing the performance requirements. Firstly you require heat to be able to regenerate oil within the columns and to desludge the transformer. You will require vacuum to reduce gas levels performance table requirements under section 4.2 (Page 6).</p>	<p><u>Response related to Mobile Insulating Oil Regeneration Plant:</u></p> <p>The removal of water and other impurities from used transformer oil shall be based on the system to be proposed by the Vendor. If the design is based on the use of filters using adsorbent materials, the adsorbent in the filters must be properly contained in a cartridge or similar packaging.</p> <p>It is expected that in order to remove water and other gaseous impurities from the used transformer oil, the oil shall be subjected to vacuum, increase in the temperature or a combination of both.</p> <p>Fuller’s Earth or other adsorbent materials are general used to remove acidic and other impurities from used transformer oil, therefore it is expected that the offer of transformer oil regeneration plant include similar components.</p> <p><u>Response related to Mobile Insulating Oil Filtration/Dehydration Plants:</u></p> <p>The removal of water and other impurities from used transformer oil shall be based on the system to be proposed by the Vendor. If the design is based on the use of filters using adsorbent materials, the adsorbent in the filters must properly contained in a cartridge or similar packaging.</p> <p>It is expected that in order to remove water and other gaseous impurities from the used transformer oil, the oil shall be subjected to vacuum, increase in the temperature or a combination of both.</p> <p>The transformer oil filtration/dehydration plants are expected to be based on the use of vacuuming and heating. Systems based on other techniques are also acceptable if they meet the target decontamination specifications.</p>				
<p>5. Performance Table under section 4.1 (Page 6) has a contradiction in terms Breakdown voltage and dielectric strength requirement (80KV vs 40KV). The requirement of min. 80 KV (across 2.5mm gap) is very aggressive (if not impossible)</p> <p>Also the specification requests that sulfur be removed but the performance table does not specify performance requirement for DBDS sulfur levels after treatment.</p>	<p><u>Response related to Mobile Insulating Oil Regeneration Plant:</u></p> <p>The performance specification for the mobile insulating oil regeneration plant shall be greater than 40 kV or greater of 50 kV or greater than 60kV across 2.5 mm gap depending of the oil in the transformer being treated. Specifically, the treatment of the insulating oil in the regeneration plant shall render an insulating oil that meet the qualification of “Good” according to the following table:</p> <table border="1" data-bbox="800 1927 1433 1967"> <tr> <td>System Voltage</td> <td>Good</td> <td>Fair</td> <td>Poor</td> </tr> </table>	System Voltage	Good	Fair	Poor
System Voltage	Good	Fair	Poor		

	<table border="1" data-bbox="803 100 1433 220"> <tr> <td>$\leq 72.5kV$</td> <td>$> 40kV$</td> <td>30-40kV</td> <td>$< 30kV$</td> </tr> <tr> <td>$> 72.5kV = 170kV$</td> <td>$> 50kV$</td> <td>40-50kV</td> <td>$< 30kV$</td> </tr> <tr> <td>$> 270kV$</td> <td>$> 60kV$</td> <td>50-60kV</td> <td>$< 50kV$</td> </tr> </table> <p>DiBenzilDiSulfide (DBDS) has been identified as the main cause of copper corrosion in transformer, therefore in order to maintain the integrity of the equipment, the removal of sulfur during the regeneration of the oil is an important objective. The effectiveness of the removal of sulfur during the transformer regeneration process is determined by comparing the corrosiveness of the oil before and after treatment. The performance objective of the mobile transformer oil regeneration plant is the improvement of the corrosiveness of the oil, without specific level.</p> <p><u>Response related to Mobile Insulating Oil Filtration/Dehydration Plants:</u></p> <p>The main objective of treating used oil in the mobile insulating oil filtration/dehydration plant is the removal of dissolved water in the oil and therefore, it is not expected to remove acidic or similar impurities from the oil.</p> <p>Based on this, the performance of the mobile insulating oil shall be measure on the capacity to remove water and dissolved gases. The increase of the voltage breakdown is expected because of the reduction of the moisture content in the treated oil, but it shall NOT be used as a performance parameter of the mobile insulating filtration/dehydration plant.</p>	$\leq 72.5kV$	$> 40kV$	30-40kV	$< 30kV$	$> 72.5kV = 170kV$	$> 50kV$	40-50kV	$< 30kV$	$> 270kV$	$> 60kV$	50-60kV	$< 50kV$
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<p>6. The primary goal of a Regeneration System is to reduce acidity (neutralization value), increase IFT, reduce DBDS/sulfur levels and increase dielectric strength. Its primary goal is not to dry out the paper in the transformer.</p>	<p><u>Response related to Mobile Insulating Oil Regeneration Plant:</u></p> <p>In addition of the removal of acidic and other similar impurities in the transformer oil, the treatment of the oil in the mobile insulating oil regeneration plant is to significantly reduce the level of dissolved water in the oil, not in the insulating paper.</p> <p><u>Response related to Mobile Insulating Oil Filtration/Dehydration Plants:</u></p> <p>The treatment of the oil in the mobile insulating oil filtration/dehydration plant is to significantly reduce the level of dissolved water in the oil, not in the insulating paper.</p>												
<p>7. Please confirm the expected weight and dimensions of the trailer expected for this system or specify the type of towing vehicle that is expected to be used.</p>	<p><u>Response related to Mobile Insulating Oil Regeneration Plant:</u></p> <p>These details are based on the design and construction of the plants and therefore, depends on individual Vendors.</p> <p>The end-user of the plant will provide the towing vehicle appropriate for the safe and efficient transportation of the mobile insulating oil regeneration plant.</p> <p><u>Response related to Mobile Insulating Oil Filtration/Dehydration Plants:</u></p> <p>These details are based on the design and construction of the plants and therefore, depends on individual Vendors.</p> <p>The end-user of the plant will provide the towing vehicle appropriate for the safe and efficient transportation of the mobile insulating oil filtration/dehydration plants.</p>												

<p>8. We have noticed that the specification has left out the number of columns (or KGS of clay) to be supplied for this flow rate. We assume that we are expected to provide our opinion on the number of columns for this flow rate? Will the customer want a single set of columns or would they prefer a dual column module to allow for more oil to be processed in a day. For example with a single set of lets say 6 columns, the operator may only be able to process oil for 4-6 hours before the clay is saturated and will require to wait hours in the day (14 hours) before they can regenerate oil again. By providing dual columns, one set of columns can reactivate whilst the other set of columns can be used to regenerate oil.</p>	<p><u>Response related to Mobile Insulating Oil Regeneration Plant:</u></p> <p>The design and construction of the required mobile insulating oil regeneration plant depend on Vendor’s system characteristics. The target parameters are based on performance and meeting the required technical specifications of the oil treated.</p>
<p>9. Section 5.1.8 Piping; It is an industry standard to have an oil regeneration system constructed of welded joints and some threaded fittings. It will not work and considering there is a requirement for a 3 year warranty, this is not something we recommend nor is it something we are willing to build.</p>	<p><u>Response related to Mobile Insulating Oil Regeneration Plant:</u></p> <p>The Terms of Reference indicates “All piping shall be of stainless steel with Joint Industry Council (JIC) as defined by the Society of Automotive Engineers (SAE J514) hydraulic connections and all piping shall be designed for the rated flow (500 to 1500 LPH) of the system. Threaded or welded fittings shall be avoided wherever possible. Galvanized fittings are not accepted”, therefore the Vendor has the flexibility to offer its own system. However, the 3-year warranty period is compulsory.</p> <p><u>Response related to Mobile Insulating Oil Filtration/Dehydration Plants:</u></p> <p>The Terms of Reference indicates “All piping shall be of stainless steel with Joint Industry Council (JIC) as defined by the Society of Automotive Engineers (SAE J514) hydraulic connections and all piping shall be designed for the rated flow (500 to 1500 LPH) of the system. Threaded or welded fittings shall be avoided wherever possible. Galvanized fittings are not accepted”, therefore the Vendor has the flexibility to offer its own system. However, the 3-year warranty period is compulsory.</p>
<p>10. Regen section 5.1.9 (pg.8) Connection Hoses – it asks for “transparent out containment hose of clear white” to be rated up to 1250 PSI. This is an unusual hose specification request and we have never come across this kind of hose at those pressures. We are not familiar with an oil hose that is double walled. Industry standard is to supply a tank truck rubber oil hose that has steel braid reinforcement for pressures up to 200 PSI. We will do our own research on this type of hose but has the client actually verified that the hose specified exists?</p>	<p><u>Response related to Mobile Insulating Oil Regeneration Plant:</u></p> <p>These connection hoses shall be adequately rated to bear the design delivery/suction oil pressure.</p> <p><u>Response related to Mobile Insulating Oil Filtration/Dehydration Plants:</u></p> <p>These connection hoses shall be adequately rated to bear the design delivery/suction oil pressure.</p>
<p>11. Regen section 5.1.9 (pg.8) Connection Hoses- “The solenoid valve on the discharge line shall be of slow closing type”. Industry standard is to use pneumatic ball valves or angle seat valves. Please confirm acceptance.</p>	<p><u>Response related to Mobile Insulating Oil Regeneration Plant:</u></p> <p>Pneumatic ball valves and angle seat valves shall be acceptable</p> <p><u>Response related to Mobile Insulating Oil Filtration/Dehydration Plants:</u></p> <p>Pneumatic ball valves and angle seat valves shall be acceptable</p>
<p>12. Regen Section 5.1.13 (Page 9): There is no chance of supplying a system of this type with a full load amp of 16. Please reconsider this restriction.</p>	<p><u>Response related to Mobile Insulating Oil Regeneration Plant:</u></p> <p>The available electrical supply for the Mobile Insulating Oil Regeneration Plant is a Three-phase, 415 V and 75 kW. <i>The 16 A limit is no longer valid.</i></p>

	Response related to Mobile Insulating Oil Filtration/Dehydration Plants:
13. Almost all of the same concerning points/questions brought up in the Oil Regeneration System apply to this specification as well.	The available electrical supply for the Mobile Insulating Oil Filtration/Dehydration Plants is a Three-phase, 415 V and 75 kW. <i>The 16 A limit is no longer valid.</i> All responses to the above questions have been now distinguished as referring to each type of system indicated in the ToR. Please refer to responses 3 to 12 above.
14. With regard to Mobile Insulating Oil Filtration/Dehydration Plants, Section 5.2.1 General (Page 10): Please confirm if this system only to come with a skid based system with an aluminium enclosure or is it to be provided on a trailer?	The Mobile Insulating Oil Filtration/Dehydration Plants required shall be provided on a NEMA enclosure mounted on an appropriate size flat bed or trailer to facilitate their transportation to the different locations where it is expected to operate.

To improve efficiency, kindly try to send ALL your clarification questions in one single communication.

Please also be reminded that request for clarifications, if any, shall be received two weeks prior to the offer submission deadline.