



CDM Executive Board

UNFCCC Secretariat

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May 12<sup>th</sup>, 2009

**Re: Initial response to the request for review of the request for registration CDM project activity “Energy Efficiency Measures at Desalination Plant in Chennai” (UNFCCC Ref no. 2411)**

Dear CDM Executive Board,

SGS has been informed that the request for registration for the CDM project activity Energy Efficiency Measures at Desalination Plant in Chennai” (UNFCCC Ref no. 2411) is under consideration for review because three requests for review have been received from members of the Board.

All the requests for review are based on the same reasons which are outlined below. SGS would like to provide an initial response to the issues raised by the requests for review:

**Request for Review, Issue 1:**

*The PP/DOE should further substantiate the prevailing practice barrier faced by the project activity and in particular, clarify whether the specific variable frequency drive technology had been used in the past either in desalination plants or in other industrial processes in India. The PP/DOE are reminded that they can still establish additionality on the basis of other barriers.*

**SGS’ Response to Issue 1:**

The technology used in the project activity is the installation of Medium Voltage-Variable Frequency Drive (MV-VFD) to High Pressure Pumps (HPP) in Reverse Osmosis (RO) at Desalination plant. As mentioned in our validation report page number 9, High pressure pumps are a critical component in the desalination plant employing reverse osmosis technology. MV-VFD technology is used to control the engines joined to HPP during the membrane separation process at RO stage, where the major energy requirement is needed for pressuring the feed water. Therefore, an accurate control of HPP and a customization of the operating point according to the characteristics of the sea water is a key factor to improve the energy efficiency in the plant. As mentioned in our validation report installation of MV-VFD to high pressure pumps in a desalination plant of this capacity (100,000 m3/day) in India is not a common practice as the technology of this size (2200 KW / 3.3. KV) / scale is not available in India. The same fact can be ascertained from the following supporting documents.

1. Independent opinion given by the International Desalination Association (IDA) - In its letter dated 30<sup>th</sup> July 2008 submitted with Request for registration IDA has clearly stated that the installation of MV-VFD to the High Pressure pumps in the reverse osmosis process of desalination plant can be counted as first of its kind in India. This letter was validated against its claim and authenticity during the validation of the project activity. IDA ([www.idadesal.org](http://www.idadesal.org)) is a leading global organization dedicated to desalination, desalination technology and water reuse. With more than 2,000 members from 58 countries, IDA is the hub of expertise, news and information, and professional development for the worldwide desalination industry. The reference to this letter was mentioned in the validation report submitted during request for registration on page number 11.

2. List of customers (reference list) from Siemens and ABB - Further to it Siemens (Germany) and ABB (Switzerland) are the two major players of supplier of MV-VFDs. The list of customers to whom they have supplied the MV-VFD was checked. As per Siemens list (Annexure 1), which shows the list of AC Variable Speed Drives in the Water Sector including Cooling Pumps and District Heating Pumps was provided. As per the list none of the AC Variable Speed Drives in the Water Sector has been supplied to India.

As per ABB reference list (Annexure 2), which includes all types of industries in India for which they have supplied this MV-VFD, this is the only desalination plant in India where it has supplied this MV-VFD. All other units pertain to other industries like petro chemical, cement, oil & gas, etc. No other desalination plant in India has installed this MV-VFD. Apart from this as per the list of references where ABB has supplied MV-VFD installed in industrial facilities for the water sector (Annexure 3); not even one project is in India. In addition ABB in its declaration letter (Annexure 4) dated 20<sup>th</sup> May 2008 has stated that Chennai Desalination Plant is the only desalination plant in India where they have installed this MV-VFD. Rest of them are in other countries only. The reference of Annexure 4 is already there in the validation report page number 11. This is mentioned as a confidential document which was checked by the validator during validation.

The websites of other manufacturers were also checked by the LA and do not find that any MV-VFD of the project activity size (2200 KW / 3.3 KV) was manufactured. Thus it is clear that the project activity i.e installation of VFDs in desalination plants is not a common practice in India.

Allen Bradley (<http://www.variablefrequencydrives.net/baldorvs1pfpumpfandrides.htm>),

Rockwell Automation ([http://literature.rockwellautomation.com/idc/groups/literature/documents/at/drives-at002\\_-en-p.pdf](http://literature.rockwellautomation.com/idc/groups/literature/documents/at/drives-at002_-en-p.pdf)),

IDE Technologies (<http://www.ide-tech.com/AllProducts.asp?id=1569&sid=1573&pid=1573>)

3. IDA database - As already mentioned in Validation Report submitted during the request for registration on page 11; extracts from the International Desalination Association (IDA) ([www.idadesal.org](http://www.idadesal.org)) year book 2007-2008 was also checked. It was verified from the page 105 of the report (submitted with request for registration) that the desalination plant which is constructed at Minjur, Chennai i.e. project activity site with capacity of 100 MLD i.e. 100,000 m<sup>3</sup>/day capacity is the single largest desalination plant in India in terms of capacity among all types of desalination technologies used in India. IDA also maintains a database of major desalination plants in the world. The database is available at [www.desaldata.com](http://www.desaldata.com). But registration is required to access information. PP provided the screen shot (submitted with request for registration) of the IDA database for reference. From the screen shot it was verified that in India the Minjur Desalination plant is the largest in terms of capacity (100,000 m<sup>3</sup>/day) and employing the reverse osmosis process (RO). Also the other plants in India employing RO process is not employing MV-VFD as checked from the documents submitted (Annexure1, 2, 3, 4) with this response. This was also checked from the websites mentioned above. The second (96,000 m<sup>3</sup>/day) and third (48,000 m<sup>3</sup>/day) in terms of capacity are located at Jamnagar and both employ the Multi Effect Distillation Technology (MED). The next highest plant using the RO technology is of capacity 26,000 m<sup>3</sup>/day. MED technology don't require very high pressure pumps as compared to RO technology. Hence this is the first desalination plant in India of this capacity to use RO process and also to install VFD to this high pressure pumps (design capacity of 892 m<sup>3</sup>/hr and power of 2200 kW). Hence installation of VFD to very high pressure pumps in a desalination plant in India is not a common practice as the technology of this size / scale is not available in India.

In view of the above it can be concluded that the specific VFD technology has not been installed in any other desalination plants of this capacity in India. Also in other industries as well it is not a common practice in India.



## **Request for Review, Issue 2:**

*The DOE is requested to clarify how it has validated the input values used in the energy savings calculations.*

## **SGS' Response to Issue 2:**

The energy saving calculation with and without VFD has been done using a excel spread sheet software provided by Befesa Agua S.A.U. (Annexure 5), the technology supplier for the project. All data, calculations and input values, have been certified by the Desalination Director of Befesa in a letter dated on 02/10/2008 (Annexure 6). These details were validated during the validation and found satisfactory. The validation report submitted with the request for registration confirms the same on page number 10 under the discussion of CAR #13. The data related to the energy savings was checked during validation. The evidence provided herewith as Annexure 5 and 6 were kept as confidential documents as per the request from the project proponent. This was already cleared in the validation report submitted with the request for registration on page 10.

We feel that the clarification sought by board members has been taken into account. We do however apologize if this was not sufficiently clear from the earlier validation report.

Pankaj Mohan (+91 98717 94671) will be the contact person for the review process and is available to address questions from the Board during the consideration of the review in case the Executive Board wishes.

Yours sincerely

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Enclosures

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|------------|---|
| Annexure 1 | Siemens Reference List AC Variable Speed Drives |
| Annexure 2 | ABB Reference List ACS 1000 in India            |
| Annexure 3 | ABB Reference List VFD in water sector          |
| Annexure 4 | ABB Declaration dated 20/05/2008                |
| Annexure 5 | Befesa Pump data input values spread sheet      |
| Annexure 6 | Befesa certification letter dated 02/10/2008    |