

Environmental and Social Monitoring Report

Project Number: 43937-014
2nd Annual Report 2015
April 2016

Pakistan: Zorlu Enerji Power Project

Prepared by Élan Valorisation (Pvt.) Ltd for Zorlu Enerji Pakistan Limited and the Asian Development Bank.

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Zorlu Wind Power Project Environmental and Social Monitoring Report

2nd Annual Report 2015 (Operational Phase)

Ref.: FRT16V01ZEA



April 2016

Prepared for
Zorlu Enerji Pakistan Limited

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LIST OF ACRONYMS

AEDB	Alternate Energy Development Board
ADB	Asian Development Bank
AQMP	Air Quality Monitoring Plan
BMP	Bird Monitoring Plan
CCDP	Comprehensive Community Development Plan
CV	Curriculum Vitae
DRP	Data Record Plan
DRS	Data Record Sheets
ECA	Employment of Child Act
EEE	Economics, Energy and Environment
EIA	Environmental Impact Assessment
EHS	Environmental, Health and Safety
EMP	Environmental Management Plan
EPC	Engineering, Procurement and Construction
ESI	Environmental and Social Inspector
ESO	Environmental and Social Officer
HESCO	Hyderabad Electric Supply Company
HSE	Health, safety and Environment
IEE	Initial Environmental Examination
IFC	International Finance Corporation
KYWDO	Keenjhar Youth Welfare Development Organization
MSDS	Material Safety Data Sheets
NCHD	National Commission for Human Development
NGOs	Non-Government Organizations
NTDC	National Transmission and Dispatch Company
NOC	No Objection Certificate
NMP	Noise Monitoring Plan
Pak-EPA	Pakistan Environmental Protection Agency

PEC	Pakistan Engineering Council
PEPA	Pakistan Environmental Protection Act
PD	Project Director
PPEs	Personal Protection Equipments
RO	Reverse Osmosis
SEPA	Sindh Environmental Protection Agency
SWMP	Solid Waste Management Plan
WBG	World Bank Group's
WWF	World Wide Fund for Nature

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1. Introduction

In order to monitor environmental and social compliance during operation phase of Zorlu wind farm Élan Valorisation (Pvt.) Ltd. is entrusted as independent monitoring consultant. Zorlu Wind Farm has been under commercial operation since June, 2013. Zorlu (O&M) Pakistan Ltd is Operation and Maintenance contractor of the wind farm. The monitoring has to be carried out to ensure implementation of Environmental and Social Management Plan (ESMP), Air Quality Monitoring Plan (AQMP), Noise Monitoring Plan (NMP), Solid Waste Management Plan (SWMP), Bird Monitoring Plan (BMP), Specific Training Record Sheets, Risk Assessment Sheets, Emergency Response Procedures (ERP), EHS Regulations, Zorlu O&M Regulations and CCDP.

Document in hand is 2nd annual Environment and Social Monitoring Report (ESMR) of ZORLU Wind Farm. The report covers monitoring of environmental and social compliance at/around ZORLU Wind Farm in year 2015. Data of previous year monitoring is available in annexures. This report has been prepared for submission to International Finance Corporation (IFC).

1.1 Zorlu Wind Farm

Total land area of Zorlu Wind Farm comprises 1,300 acres of land. It is located about 100 km southeast of Karachi near Jhimpir town in Thatta District. The site is located in a flat rocky area and is about 50m above sea level. The site is approachable by roads and rails both. Wind Farm site is accessible through Super Highway as well as through National Highway. Under construction Motorway is also passing near the site.

The Wind farm is developed in two phases. In 1st phase 6 MW, five German-made gearless VENSYS 62 wind turbines each capable of producing 1.2 MW were installed/connected with 11 KV HESCO network. It started generation in April 2009. In 2nd phase, 28 more wind turbines of 1.8 MW capacity each, supplied by Vestas of Denmark were installed to produce a total of 50.4 MW electricity. This increased the capacity of the project to 56.4 MW. The project was completed in March 2013. The capacity enhancement of the Project was approved by Alternate Energy Development Board (AEDB). All turbines have been connected to a substation with an underground power cable system. The sub-station is connected to national grid system of HESCO/NTDC. The wind farm is operational continuously since its commissioning. Its yield for in 2015 which 2nd year of operation is given in following table;

Table 1-1: Complex Energy Yield and Power Curve 2015

Month	Achieved Average wind speed m/s	Achieved monthly production MWh	Wind speed m/s	Power curve in KW
January	6.1	8421.0	4.0	82
February	7.0	10738.0	5.0	191
March	6.3	9801.0	6.0	344
April	7.5	12709.0	7.0	555
May	9.2	18681.0	8.0	840
June	7.8	13231.0	9.0	1170
July	10.8	21422.0	10.0	1497
August	10.3	22437.0	11.0	1730
September	7.5	13323.0	12.0	1800
October	6.6	9407.0	13.0	1800
November	6.6	9306.0	14.0	1800
December	5.3	5512.0	15.0	1800
AVERAGE WIND SPEED & TOTAL PRODUCTION	7.6	154988.0		

1.2 The Developer – ZEPL

Zorlu Wind Farm has been developed by Zorlu Energy Pakistan Limited (ZPEL), a subsidiary of the Turkish firm Zorlu Enerji. Zorlu O&M Pakistan Limited (ZOMP) is providing operation and maintenance services to ZPEL at Zorlu Wind Farm.

1.3 The Client – IFC

International Finance Corporation (IFC), a member of World Bank Group, has invested \$38.1 million with Zorlu Enerji Pakistan. Zorlu Enerji is a key IFC client in the renewable energy sector and is considered to be one of experienced members of electricity generation/distribution market of world. With presence in many countries of the world; ZORLU decided to enter in renewable energy sector of Pakistan by establishing a wind power plant at Jhimpir, District Thatta of Sindh Province. Implementation of ESMP, EIA, CCDP and environmental & social compliance during O&M phase of the project is one of the mandatory requirements set by project financing agency IFC. Accordingly Élan Valorisation (Pvt.) Ltd has been entrusted assignment for monitoring the implementation of ESMP, EIA and CCDP.

1.4 The Consultant – Élan Valorisation (Pvt.) Ltd

Élan Valorisation (Pvt.) Ltd. is the sister company of Élan Partners (Pvt.) Ltd. which is dedicated for environmental and social studies. Élan Valorisation comprises of

highly experienced team of environmental and social professionals having multidimensional experience to deal with the environmental and social aspects of developmental activities in Pakistan.

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1.5 Environmental and Social Monitoring

Environmental and Social Management Plan (ESMP) for construction phase was prepared as part of Environmental Impact Assessment (EIA). EIA for first phase were carried out in 2008 and for second phase 2012. Get approved both these from Sindh-Environmental Protection Agency (Sindh-EPA) vide letter Reference No. EPA/S/E/2008/4/9EIA90 dated 29.3.2009. Bird Monitoring Plan (BMP) and Comprehensive Community Development Plan (CCDP) as suggested in EIA report, were developed and get approved in 2012.

Environmental and Social Management Plan (ESMP) for O&M phase of the project was prepared in 2014 and sent to the Zorlu. Under the national and international environmental laws/regulations, project developer (Zorlu Enerji Pakistan Ltd) is required to implement the approved ESMP (for O&M phase), EIA, BMP and CCDP in letter and spirit.

This ESMR highlights status of environmental performance at Zorlu Wind Farm by documenting environmental compliance measures adopted by the project developer (Zorlu Enerji Pakistan) and O&M contractors (Zorlu O&M Pakistan). Deficiencies in environmental & social compliance and recommendations for improvement are the part of this report. Compliance of approved EIA and ESMP has particularly been documented in the report.

2. ENVIRONMENTAL PERMISSIONS AND COMPLIANCE CERTIFICATES

Environmental Impacts Assessment (EIA) of Zorlu Wind Farm was carried out and Environmental and Social Management Plan (ESMP) was prepared under the national and international environmental laws and regulations including, Pakistan Environmental Protection Act, 1997, Pakistan Environmental Protection Agency (Pak-EPA) EIA/IEE Review Guidelines, 2000, IFC-Environmental and Social Review Procedures and World Bank Environmental and Social Safeguard Policies.

EIA including ESMP for the first phase of the project was approved by Sindh-Environmental Protection Agency (Sindh-EPA) on 09-04-2008 and No Objection Certificate (NOC) was issued. Whereas; the second phase EIA and ESMP was approved by the same agency (Sindh-EPA) on 21-04-2012.

Previously approved ESMP was only prepared for construction phase of the project. ESMP for O&M phase was prepared currently and submitted to the project developer (Zorlu Enerji). For further approval Zorlu Enerji will submit ESMP to Sindh-EPA.

Sindh-EPA issued environmental approval subjected to specific conditions which are required to be fulfilled by project developer. A few of the conditions of environmental approval and their compliance status have been provided in **Table 2-1** below:

Table 2-1: Conditions for Environmental Approval for Zorlu Wind Farm

Conditions of Environmental Approval	Compliance Status
Project will be constructed at safe distances away from any area of environmental and social sensitivity.	Complying with this condition, Zorlu Wind Farm has been constructed at barren land away from human settlements and no such areas of environmental and social sensitivity are located near the wind farm site.
No industrial or residential activity will be allowed at wind farm site.	No such activity is being done at wind farm site.
Employment shall be provided to local skilled and unskilled people.	Zorlu Enerji has appointed 17 numbers of local people for various skilled and unskilled jobs during O & M period at wind farm. Detail of local people employment has been provided in upcoming sections of the report.
Project proponent will ensure the implementation of EIA and EMP and will report the responsible authority.	Zorlu has appointed the Élan Valorisation (Pvt.) Ltd as environmental and social monitoring consultants, to ensure the implementation of EIA and EMP. Environmental and social monitoring reports are also prepared on quarterly basis for submittal to Sindh-EPA and other relevant organizations such as International Finance Corporation (IFC) and Asian Development Bank (ADB).
Project proponent will be responsible to implement all relevant sections of Pakistan Environmental Protection Act (PEPA, 1997) and Pak-EPA EIA/IEE Regulations	All relevant sections of PEPA, 1997 and Pak-EPA regulations are being implemented at Zorlu Wind Farm. No major violations have been recorded during the reporting period.

3. FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL MONITORING

Environmental and social compliance monitoring of the Zorlu Wind Farm is being carried out by Élan Valorisation (Pvt.) Ltd on regular basis. Team of environmental and social experts carries the environmental and social monitoring of the project on quarterly basis during O & M phase and environmental and social monitoring reports are prepared and submitted to the Zorlu Enerji Pakistan Limited.

3.1 Components of Environmental & Social Monitoring

This section provides the process of environmental and social monitoring which is being carried out during O & M period of Zorlu Wind Farm. Step wise description of various elements and activities of environmental and social monitoring is provided below:

3.1.1 Site Visits by Environmental Experts

Environmental and social experts of Élan team visited the site on quarterly basis during O & M phase. During the site visit following activities related to environmental and social monitoring were carried out during the site visits:

- Meeting with O & M personnel at site particularly those responsible for environmental management and implementation of EIA at Zorlu Wind Farm;
- Monitoring of environmental and social compliance documents;
- Field monitoring;
- Concluding meeting with project developer (Zorlu Enerji).

Relevant environmental and social data is collected from site personnel. Available data is processed and findings are drawn related to the environmental management and compliance status of O & M activities of Zorlu Wind Farm.

During site visit, besides the collection of data from project personnel, environmental experts of Élan also carry out detailed site visit at key components of the project including:

- O & M Camp¹;
- Grid Station;
- Control Building;
- Wind Turbines;
- Other O & M facilities such as sewerage tanks, solid waste dumping site and store rooms are also examined during the site visits.

¹ It is to mention here that at the moment, construction camp is being used as O & M camp and it is planned that new O & M camp will be constructed near the O & M control building.

Each site visit comprises the following major activities:

3.1.2 Meeting with Project Personnel

During each site visit, three types of people are generally met which include:

- Site personnel responsible for environmental management and implementation of EIA and EMP at Zorlu Wind Farm;
- Management at project site including site manager and;
- Senior management of Zorlu at Zorlu head office located at Karachi.

These meetings are aimed at verbal communication of environmental management and compliance status to the relevant personnel. Deficiencies in environmental performance if any and corrective measures are also discussed during the meetings.

3.1.3 Monitoring of Environmental Compliance Documents

EIA and ESMP put the need to prepare, maintain and implement the environmental compliance documents by the O & M contractors which include; Solid Waste Management Plan, Air and Noise Quality Monitoring Plan, Water Quality Monitoring Plan and HSE Plan. Adequacy and implementation status of environmental compliance documents is evaluated and suggestions for further improvement are communicated to the relevant site personnel and senior management of Zorlu as well.

3.1.4 Field Monitoring

Field monitoring is carried out in order to assess the compliance status and effectiveness of, in practice mitigation measures at O & M sites including; O & M camp; grid station, O & M control building and O & M facilities (solid waste dumping site, store rooms, sewerage tanks).

Following is the list of areas focused during the environmental and social monitoring. These areas serve as monitoring indicators and show the implementation and adequacy of mitigation measures proposed in EMP to minimize the potential environmental and social impacts of the project during O & M phase:

- Air quality;
- Noise;
- Water quality;
- Soil contamination;
- Solid waste management;
- Wastewater;

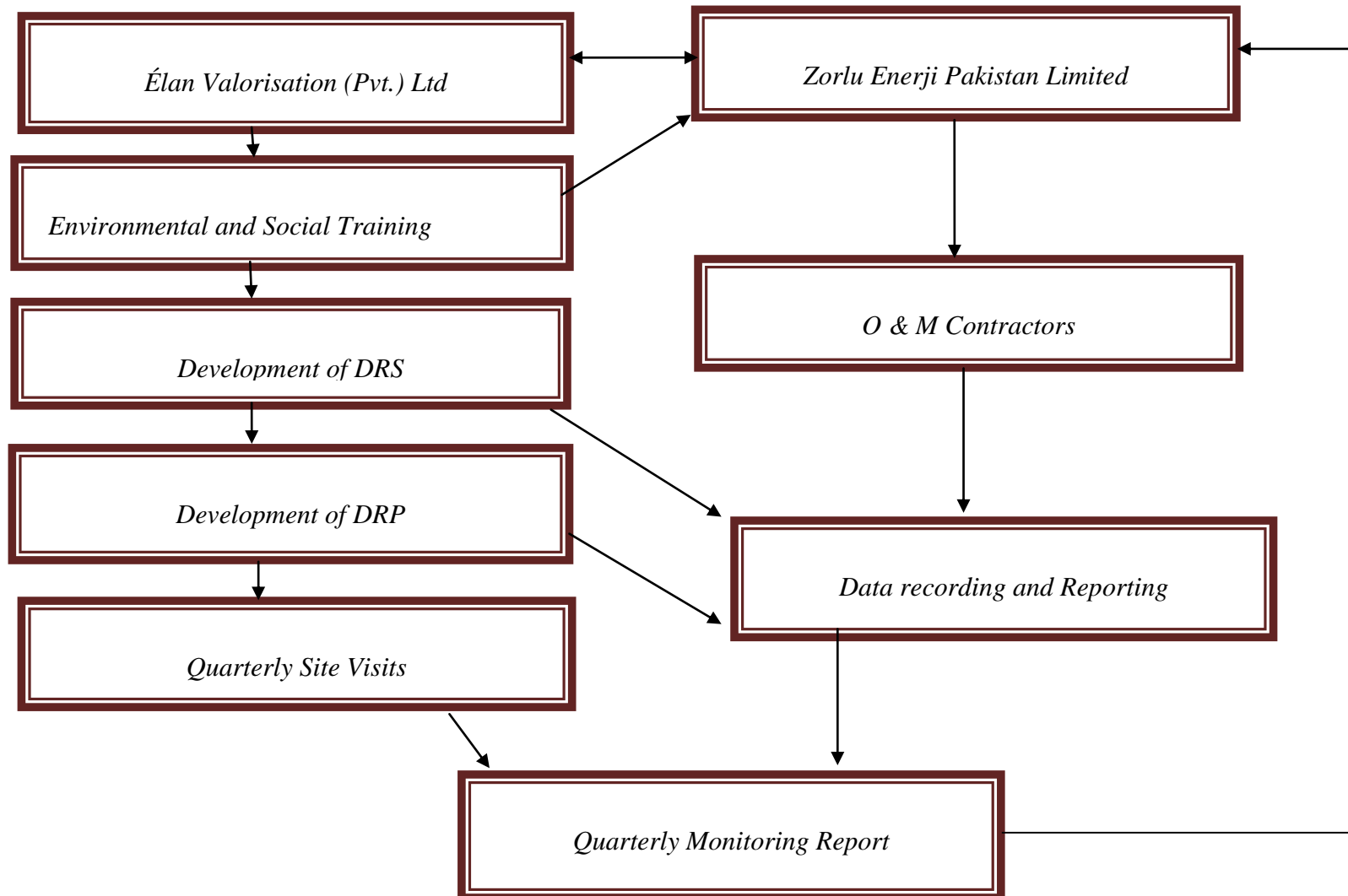
- Flora and Fauna;
- Bird monitoring;
- Health and safety of workers/employees; and
- Community development

Findings of the environmental and social monitoring are documented in the form of quarterly environmental monitoring reports which are communicated to the client on quarterly basis during O & M phase. Environmental and social monitoring reports comprise of the following main elements/sections:

- Existing status of environmental management and compliance with approved EIA and ESMP;
- Shortcomings/deficiencies in environmental performance of the project;
- Recommendations for corrective/remedial measures;
- Conclusion.

Exhibit 3-1 presents the flow chart of existing mechanism of environmental and social monitoring at Zorlu Wind Farm.

Exhibit 3-1: Existing Mechanism of Environmental and Social Monitoring at Zorlu Wind Farm



Following is the list of persons involved in monitoring exercise whereas profiles of the experts have been attached at **Annexure B**.

Muhammad Ziauddin	Team Leader
Naveed UI Haq	Manager Environment and Resettlement
Sadiqullah Khan	Environmentalism
Shamsa Naz	Social expert & Environmentalism
Yawar Abbas	Environmentalism
Komal Siddique	Environmentalism
S. Anwar Raza	Coordination and Logistics Officer

4. ACCIDENTS RELATED TO ENVIRONMENT/SAFETY

Health and safety measures are well cared of at all project locations including O & M camp, grid station and O & M control building. Necessary health and safety equipment's have been made available to the workers at all project locations. However; still there are few deficiencies found regarding health and safety measures which include: solid waste management and current RO Plant wastewater disposal arrangements. These may be reviewed to bring improvements.

4.1 Accidents Related to Work Place Safety

O & M contractors have established well developed mechanism of HSE monitoring and reporting which has been discussed in upcoming section. During the reporting period, no incident of environmental and safety accident was reported. O & M contractor has established proper Safety Accident Report Forms to record and report any incident of safety accident. A sample safety accident report form is attached as **Annexure C**. An equipped first aid room and ambulance facility is available at O & M camp with the qualified nursing staff available for twenty four hours. It is needed that first aid items and medicines should be monitored on regular basis and replaced when required. Record of such replacements should be maintained properly.

First aid boxes have been maintained at various locations within the O & M control building. Various first aid items and medicines are placed in these first aid boxes.

Proper PPEs have been maintained within the O & M control building and all workers and O & M staff uses these PPEs when required. A sample PPEs inspection sheet is provided as **Annexure D**.

5. LABOR RELATIONS – LEGAL FRAMEWORK

Environmental Impact Assessment of the Zorlu Wind Farm has been conducted under the following laws and regulations related to the labor conditions.

5.1 Factories Act, 1934

The clauses relevant to the proposed project are those that address the health, safety and welfare of the workers, disposal of solid waste and effluents, and damage to private and public property. The Act also provides regulations for handling and disposing toxic and hazardous substances. The Pakistan Environmental Protection Act of 1997, supersedes parts of this Act pertaining to environment and environmental degradation.

5.2 Employment of Child Act, 1991

Article 11(3) of the Constitution of Pakistan prohibits employment of children below the age of 14 years in any factory, mines or any other hazardous employment. In accordance with this Article, the Employment of Child Act (ECA) 1991 disallows the child labor in the country. The ECA defines a child to mean a person who has not completed his/her fourteenth years of age. The ECA states that no child shall be employed or permitted to work in any of the occupation set forth in the ECA (such as transport sector, railways, construction, and ports) or in any workshop wherein any of the processes defined in the Act is carried out. The processes defined in the Act include carpet weaving, bidi (kind of a cigarette) making, cement manufacturing, textile, construction and others. The project proponent and its contractors will be bound by the ECA to disallow any child labor at the project sites or campsites.

5.3 IFC-Environmental, Health and Safety Guidelines 2007²

The project has also been analyzed against new World Bank Group's Environmental, Health and Safety Guidelines 2007, including:

- IFC/WBG EHS General Guidelines, April 30, 2007;
- IFC/WBG EHS General Guidelines for Wind energy, April 30, 2007;
- IFC/WBG EHS General Guidelines, for Electric Power transmission and Distribution, April 30, 2007;
- Social Security Guidelines of International Labor Organization (ILO).

² The technical revision of the EHS Guidelines is expected to last three years and will be done in four phases. Each phase will consist of a "batch" of EHS Guidelines to be updated concurrently. The first batch/phase begins with a limited number of EHS Guidelines in 2013. It will also serve as a piloting phase that will inform the ramp up of subsequent phases/batches that will include a larger number of Guidelines.

Monitoring of labor relations and conditions at wind farm site is governed by above mentioned laws and guidelines. During O & M phase, 17 people have been appointed from nearby local communities. O & M security staff works in two shifts and each shift comprises twelve hours duration whereas; the technical staff works in three shifts and each shift lasts for eight hours. It is to mention here that O & M contractor pays overtime wages to all staff working more than duty hours. Local O & M staff also returns to their homes after completing their shifts. O & M contractor has well established procedures to treat the workers and procedures of payments to employees. Zorlu believes in equal share of working opportunities for workers from all areas, races and tribes. Therefore there are less chances of any dispute and sense of inequality among the workers. All workers are treated equally in accordance with the established procedures. No incident of labor disputes and non-compliance with any Social Protection Requirements has been noted during the reporting period.

6. CAPACITY FOR REGULAR MONITORING OF ENVIRONMENTAL AND SOCIAL ISSUES

In accordance with the recommendations of Environmental Management Plan, following proposed personnel will assign the duties to look after the environmental and social issues of the project:

O & M Phase Staff

- Environmental and Social Inspector (ESI), Project Developer;
- Environmental and Social Officer (ESO), O & M Contractor;
- Shahid Ali- HSE Manager, O & M Contractor;

Roles and responsibilities of HSE Manager in accordance with ESMP are as below:

- The ESI will ensure implementation of the environmental management plan in the field. He will also coordinate with the O&M contractor's management and ESO of contractors. If any monitoring teams from government departments or from NGOs visit the field during the field activities, the ESI will be responsible for coordinating their visits;
- The ESO of contractor will be responsible for the implementation of the ESMP during O&M phase. He will also be responsible for communication with and the training of their respective O&M staff in all aspects of the ESMP;
- HSE Manager will ensure the implementation of health and safety measures and approved HSE plans during O & M phase of the project.

Environmental and HSE persons are well educated and experienced. They are well aware of the environmental and social requirements of the project as well as familiar with the basic tools of environmental management, health and safety and have sufficient knowledge of relevant national and international environmental laws and regulations.

6.1 Environmental and Social Trainings

Plan for environmental and social trainings for O&M phase of the project has been prepared as part of EMP. Environmental and social trainings will be aimed to ensure that the requirements of the EIA and ESMP can be clearly understood and followed by all project personnel throughout the O & M period. The trainings will be provided to the Zorlu staff, the O & M contractor, and other staff engaged for the project operation and maintenance. The environmental and social training will cover all staff levels, ranging from the management and supervisory to the skilled and unskilled categories. The scope of the training will cover general environmental awareness and the requirements of the EIA and the ESMP, with special emphasis on sensitizing the project staff to the environmental and social aspects of the area.

During the reporting period i.e. January, 2015 to December, 2015 one training namely Basic Safety Training is conducted. The training is arranged at ZORLU Wind Farm on 12.2.2015. The training is given by VESTAS Company which is supplier of turbines installed in 2nd phase.

7. STAKEHOLDER CONSULTATION UNDER CORPORATE SOCIAL RESPONSIBILITY ACTIVITIES

Zorlu Enerji Pakistan Limited is well aware of the need of community development and social well-being related to the establishment of wind farm in the area. Comprehensive Community Development Plan (CCDP) has been prepared in 2012 and presently CCDP is passing through the implementation phases. As the needs and socio economic conditions of the area are changing with passage of time, so Zorlu has recently updated CCDP in 2015. Overall community in the project surrounding areas belongs to poor income groups and majority is illiterate. Following efforts have been made by the Zorlu towards the community participation and development:

7.1 Social Capacity Building

Zorlu sponsored the KYWDO computer center on recommendation of World Wide for Nature/Indus for all Programs (WWF-Indus for all programs). According to the initial agreement, Zorlu provided financial assistance of Rs. 30,000/per month to the KYWDO, computer center for the period of one year starting from March, 2012 to February, 2013. Contract with KYWDO was extended for next two years on recommendations of WWF and DCO, Thatta and has stopped in January 2015. A Social Mobilizer had also been appointed for resolving the social issues associated with O & M phase of Zorlu Wind Farm.

Zulfiqar Ali Brohi-Social Mobilizer

Mr. Brohi was responsible for capacity building and skills enhancing activities for communities and focused groups and coordination with media to sensitize the communities regarding sociopolitical, socioeconomic and gender issues.

7.2 Drinking Water Supply to Local Community

Zorlu is providing drinking water from Keenjhar Lake to the local communities through mobile water tankers. Local communities includes Urs Jhakro, Allah Bux Gujjo, Abbas Mir Bahar, Ahsan Ali Palari, Khamiso shoro, Suleman Palari, Musa Utho and Latho Gaijo residing near the wind farm site. Zorlu is also trying to provide sufficient amount of drinking water by increasing the numbers of water tankers for every village to meet the community basic requirements. It is suggested that Zorlu may provide tube-well/pressure pump in village at some central location so that the residents can fetch water for drinking and other purposes. This is an important step towards the implementation of Community Development Plan.

7.3 Promotion of Education among Local Communities

From education point of view, village Ahsan Ali Palari has improved like 2 primary schools and 1 higher secondary school is established in vicinity at 500m distance. Zorlu is committed to provide input towards the social well-being through promotion of education in the area.

Zorlu previously appointed a religious teacher at Goth, Brohi who has been providing the Quran education to the females of the village. Goth Brohi is located at the distance of about seven kilometers from project site. People of this village were in dire need of such education for their girls. In response to that, Zorlu has taken this initiative.

7.4 Flood Relief Activities

During the flood of 2011 in Thatta and adjoining coastal areas, Zorlu participated in flood relief activities in association with local welfare organization (Patarian Association). Zorlu provided about 150 shelter tents to the flood affected communities.

7.5 Coordination with Local Welfare Organizations

Zorlu has established sound coordination with Non-Government Organizations (NGOs) and developmental partners in the area such as World Wide Fund for Nature (WWF), Keenjhar Youth Welfare Development Organization (KYWDO) and National Commission for Human Development (NCHD).

In response to community development plan, Zorlu has started initiatives particularly in education and skill development sector as previously discussed. In March, 2012, an agreement was signed with Keenjhar Youth Welfare Development Organization (KYWDO) Jhimpir. According to the agreement, Zorlu will sponsor the KYWDO computer center on recommendation of World Wide for Nature/Indus for all Programs (WWF-Indus for all programs).

So for, KYWDO, computer center has provided basic computer trainings to approximately 92 boys and 35 girls. Major training courses conducted at computer center include: i) 4 months computer short courses; ii) Introduction to windows; iii) typing tutor; iv) MS Office; v) Basic knowledge of internet.

It is to mention here that coordination and support to KYWDO is not in practice since January 2015.

7.6 Employment Opportunities for Local Community

Zorlu provides employment opportunities to the local people on priority basis. Total 17 local people have been appointed during O & M phase. On the basis of skills and qualifications, local people have been working on various positions at Zorlu Wind Farm including security, masonry, engineering, store keeping, social works and

labor. List of local people working at Zorlu wind farm during O & M phase is provided at **Annexure F**. In a village namely Urs Jhakro employment ratio has increased upto 20%. Due to developmental activities and the investment of international companies in the area, the job opportunities are available for the local community.

7.7 Promotion of Procedures for (a) Hiring and; (b) Acquisition of Local Goods and Services

Zorlu provides maximum possible opportunities to the local people and local market for acquisition of goods and services. Following services and goods are acquired from local market and local people for O&M phase of the project:

- Water supply contract has been awarded to the local supplier of Jhimpir. Zorlu has engaged a single water supply contractor which is authorized to engage any local person for water supply business. Water tankers belonging to multiple people have been rented for supplying water to wind farm.

8. IMPLEMENTATION STATUS OF MITIGATION MEASURES IN ESMP

Environmental and Social Management Plan (ESMP) was prepared to address the environmental and social requirements of O&M phase. Environmental and social compliance monitoring for O&M phase was awarded to Élan Valorisation (Pvt.) Ltd. in August, 2014. Till the time of reporting the ESMP for O&M phase was in process, therefore for reporting purpose we have followed the existing ESMP. Formal implementation of ESMP was started during the month of August, 2014 after the environmental and social training imparted by the Élan Valorisation to the project staff and workers particularly to the people involved in the implementation of ESMP including HSE Manager of O & M contractor.

Data Record Sheets (DRS) had been developed for monitoring the compliance with ESMP as well as for effect monitoring³. DRS for both compliance monitoring and effect monitoring are filled and signed by the ESO under the supervision of ESI as per frequencies suggested in Data Record Plan (DRP)⁴.

As mentioned earlier, Environmental and Social experts of Élan Valorisation visit the wind farm site on quarterly basis and quarterly environmental and social monitoring reports are prepared and submitted to the Zorlu Enerji Pakistan Limited. Quarterly monitoring reports highlight the status of environmental compliance, deficiencies and shortcomings and recommendations for future improvements in accordance with national and international environmental standards including mainly the Pakistan Environmental Protection Act, 1997, Pak-EPA guidelines, Environmental and Social Review Procedures of the IFC and World Bank Operational Policies as applicable to the project with particular focus to monitor the compliance with Environmental and Social Management Plan (ESMP) and EIA.

8.1 Existing Status of Environmental Compliance at Zorlu Wind Farm

Summary of environmental management and compliance with EIA and ESMP during the reporting period (January to December, 2015) has been provided in **Table 8-1** below. First column of the table indicates the environmental and social parameters; whereas second and third columns indicate the existing status of environmental and social management against each parameter and highlights the deficiencies and improvement measures required respectively.

³ Effect monitoring was the part of ESMP to monitor the effectiveness of mitigation measures proposed in ESMP

⁴ Data Record Plan has been developed in order to scheduled the monitoring activities which includes the monitoring frequencies, monitoring locations and monitoring responsibilities

Table 8-1: Existing Status of Environmental Compliance at Zorlu Wind Farm

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
Air Quality	<ul style="list-style-type: none"> In compliance with ESMP, Air Quality Monitoring Plan (AQMP), has been prepared by EPC contractor; Air quality is monitored in accordance with the requirements set in DRS and DRP; Water sprinkling is practiced as appropriate at locations of potential dust emissions; Project vehicles and machinery is tuned and maintained in good working conditions. 	<ul style="list-style-type: none"> AQMP needs some improvements in terms of its contents and format; Project vehicles over speeding causes excessive dust emissions.
Noise	<ul style="list-style-type: none"> Noise Monitoring Plan (NMP) has also been prepared and implemented at relevant project locations; Noise monitoring is being carried out at relevant locations. 	<ul style="list-style-type: none"> NMP also requires some improvements in terms of its adequacy and to make it site specific.
Water Quality	<ul style="list-style-type: none"> For drinking purposes, most of the time, potable mineral water purchased from some certified companies is being used at project site; Contractor has installed commercial scale water treatment plant at construction camp which works on Reverse Osmosis (RO) technique of water purification from salts and other unwanted agents. The treated water is mainly used for bathing and washing purposes for workers/staff. Water quality of treated water is monitored on monthly basis to analyze its fitness for drinking purposes. To ensure the proper functioning, filtration membranes of RO plant are replaced on weekly basis. Refused water from RO plant is being stored in wastewater collection pond. 	<ul style="list-style-type: none"> Filtration membranes of water treatment plant should be replaced periodically to ensure the better quality water; RO waste water collection pond should be properly lined and fenced.
Soil Contamination	<ul style="list-style-type: none"> Oil spillage from fuel storage containers and generators may contaminate the soil. As an existing practice, polythene sheets have been spread beneath the fuel containers and generators to avoid the soil contamination from oil leakages and spills; 	<ul style="list-style-type: none"> Polythene sheets used for collection of waste oil should be replaced regularly; The refused water from RO plant is stored in a burrow pit. The method may be reviewed to improve from safety point of view.

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
Solid Waste Management	<ul style="list-style-type: none"> • Solid Waste Management Plan (SWMP) has been prepared and implemented at project site. • As the existing practice, solid waste is collected from all locations at wind farm and dumped at waste dump site located away from the O&M camp. • Empty water bottles and other containers are separately collected and stored for the scavengers. 	<ul style="list-style-type: none"> • SWMP as discussed with project staff needs some revisions to be made to make it more specific to actual site conditions; • Waste collection and segregation process needs some improvement in terms of its efficiency and effectiveness.
Waste Water	<ul style="list-style-type: none"> • Separate septic tanks for collection of grey (water from kitchen and washing and bathing) and black water (water from toilets) have been constructed at O&M camp; • Septic tanks for waste water and rain water have also been constructed at O & M control building; • Septic tanks are emptied when required. Waste water from tanks is sucked into mobile waste water tanks and released at some suitable locations with prior consent of land owners. 	<ul style="list-style-type: none"> • Septic tanks at O & M control building requires vent pipe to be installed to release the exhaust gases.
Flora, Fauna and Bird Monitoring Plan	<ul style="list-style-type: none"> • Zorlu Wind Farm is located at barren land near Jhimpir town in Thatta District, Sindh. Due to coarse and sandy soil structure, natural vegetation is scarce in the area except widely spaced shrubs and bushes. Wild bushes from small patches of land were cut to clear the land for construction activities of wind farm; • Likelihood of bird mortality has been identified in EIA report as potential negative impact of Zorlu Wind Farm. Migratory birds coming from Siberia may encounter with wind turbines during their staging at Keenjhar Lake located near the wind farm. It was recommended in the EIA report that Bird Monitoring Plan (BMP) should be prepared and implemented at wind farm; • Accordingly, BMP was developed by Élan Partners (Pvt) Ltd and approved in 2012. In compliance with the BMP, bird monitoring is being carried out at wind farm. On the basis of bird monitoring data, bird monitoring report for the reporting period is being prepared. The process of bird monitoring and findings of bird monitoring report have been provided at Annexure G. • Further as a mitigation measure, wind turbines at Zorlu Wind Farm have colored blades to facilitate the migratory birds so that they can visualize and sense the presence of these alien structures (wind 	<ul style="list-style-type: none"> • Compensatory plantation of native floral species or alternative arrangements should be as the plantation of drought and salt loving grasses may be started; • Zorlu Energy should maintain close coordination with wildlife department and WWF throughout the period of project operation and maintenance. • Bird monitoring study is concluded. COCLUDING STATEMENT is at Annexure G.

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
Workers Health and Safety	<p>turbines) from far of distance and height.</p> <ul style="list-style-type: none"> • Zorlu O&M has established and implemented the EHS Plan for O&M phase of the project. • Well experienced and qualified HSE Engineer has been appointed by O & M contractor to look after the matters related to workers health and safety; • Availability and use of Personal Protection Equipment's (PPEs) have been observed as common practice at Zorlu Wind Farm. However, due to habitual reasons, some workers are always reluctant to the use of PPEs; • Equipped first aid room has been maintained at O&M camp⁵. Qualified dispensers are available twenty four hours for emergency treatments and first aids. Services of doctor are also available in case of severe emergencies which is available at site on phone call. Record of first aid medicines is properly maintained with their expiry dates. First aid data is recorded on daily basis in separate register including the details such as name of patient, nature of illness, treatment/medicines provided. On the basis of first aid records, first aid report is prepared on weekly basis. First aid arrangements have also been maintained at control building and grid station. • An ambulance equipped with basic first aid facilities is available 24 hours at project site; • Proper trainings are provided to O & M staff related to firefighting, first aid, work permit including work at height, use of PPEs, risk assessment and other health and safety measures. Training records are properly maintained on specific training record sheets which is provided at Annexure E; • Risk assessment sheets are also developed for risk analysis. A sample risk assessment sheet is provided at Annexure I. • HSE Manager regularly monitors the workers' health and safety. On the basis of HSE monitoring, weekly progress report is prepared. • Fire extinguishers have been installed at various project locations such as O&M camp, grid station and control building. All fire 	<ul style="list-style-type: none"> • Trainings related to health and safety matters should be provided to the workers/employees on regular basis during the operational phase of the project; • Moreover there should be compulsory induction training for every new worker covering all necessary information such as; introduction to work environment; introduction to possible work place hazards; self-protection and escape measures etc.; • All the trainings should be arranged keeping in view the literacy level and language of the workers/employees; • Design and use of PPEs should be such that it is compatible with harsh weather conditions in order to minimize the ergonomic hazards which are related to the working conditions at site. • Safety drills should also be conducted on regular basis.

⁵ Formerly used as construction camp during construction phase of the project.

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
	<p>extinguishers are inspected on monthly basis to ensure that they are working properly;</p> <ul style="list-style-type: none"> Material Safety Data Sheets (MSDS) have been made available for all chemicals and hazardous material used during the O&M works of wind farm. O & M contractor has established an Emergency Response Procedures (ERP) to address the protection of life, health, safety, environment and property during emergencies at control building. ERP for control building. O & M contractor has also established and implemented EHS Regulations for Zorlu wind farm. These EHS regulations address the health and safety measures for operators and technicians during its entirety after performing any work in wind turbines. 	
Community safety and security	<ul style="list-style-type: none"> No human population exists within the close vicinity of the wind farm site. Proper safety measures need to be adopted during the project O&M phase to ensure community safety and security due to the operation of wind turbines and electricity generation. Therefore as the safety measures during O & M phase, all wind turbines have properly fenced and gated to avoid any unauthorized entry into the arena of wind turbine. Moreover security towers have also been established all around the wind farm to look after the farm for twenty four hours. 	<ul style="list-style-type: none"> Unauthorized entries to the wind farm should be strictly prohibited.
CO ₂ emissions by the project	<ul style="list-style-type: none"> Wind energy is considered as green energy all over the world with no atmospheric emissions. However during the O&M phase of the project, small scale air emissions can happen due to vehicular and machinery exhausts and use of fossil fuels in power generators. These emissions are less significant at Zorlu wind farm as mitigation measures including maintenance of vehicles and generators are strictly adopted. Therefore CO₂ emission has least contribution to atmospheric emissions. 	<ul style="list-style-type: none"> All vehicles and generators should be tuned regularly.

9. COMPLIANCE STATUS OF COMPREHENSIVE COMMUNITY DEVELOPMENT PLAN (CCDP)

As stated earlier, Comprehensive Community Development Plan was prepared and approved in 2012 as one of the requirements of EIA implementation. The CCDP provides a framework for decision making and to establish a set of specific recommendations for future social development in the area. It is intended to provide implementation guidance.

As the requirements and socio economic conditions of the project area have changed with time. Zorlu has decided to update the CCDP for uplifting the social and livelihood conditions of the community as well as to check the compliance status of CCDP.

9.1 Priority Areas in CCDP and their Implementation Status

Following priority areas for intervention have been identified in updated CCDP:

9.1.1. Water and Sanitation

It is suggested in CCDP (2015) that Zorlu might intervene in this area by providing potable water through household and village level drinking water scheme. It was suggested that Zorlu can provide one tube-well in village at some central location, so that the residents can fetch water for drinking and other purposes. This could be done, with the help of villagers by providing some small portion of investment through VCDC. The Zorlu may coordinate and provide major share in investment.

While considering sanitation, the company may not need investment as this is the responsibility of the government. However they (Company) can encourage the residence for developing the sanitation system on self-help basis. The company can do this through social mobilization which in any case, they have to mobile the community for development of the area.

Zorlu provides clean drinking water on regular basis to the local communities as identified in CCDP. Drinking water from Keenjhar Lake is supplied to the communities through mobile water tankers. As far as the installation of tube-well at some central location is concerned, it is difficult to locate such place in the area due to the fact that local communities around the Wind Farm are scattered in large area therefore; it will be difficult for any local community to fetch water from tube-well. Another issue is the local disputes which may arise due to the installation of tube-well at some central location.

As far as sanitation is concerned, it is difficult for Zorlu to have direct coordination with local communities due to the fact that they are spread in wide area and there also exist communication barrier due to illiteracy and unawareness of local

communities. Therefore; it is required that coordination with local communities should be made through some local NGO in the project area which may play coordination role between Zorlu and local communities.

9.1.2. Health

According to the CCDP, the Company could establish medical camps in the area where necessary advices including vaccination and training to women for disease could be provided. Such medical camps could be arranged on quarterly or half yearly basis. The main objective of this activity could be vaccination and disease assessment.

This area is also un-attended due to the same problem of communication with local communities as stated earlier. It can also be implemented in coordination with some local NGO. It is suggested that support may be provided to Lady Health Worker (LHW) networks and transportation/ambulance facility be available in case of emergency situations.

9.1.3. Education

As stated in CCDP, most of the schools in project area don't have skilled teachers, organizers, who can ensure the maintenance of the schools and keep an eye on students to attend the classes regularly. These schools don't have proper drinking water facility and washroom facility. Therefore a centralized washroom and a drinking facility could solve the problem.

In addition Zorlu only have to initiate the studies by the provision of reading material (where necessary) including books.

The illiterate male and female population aging from 15-35 should be provided basic literacy skills through Community or home based centers at their own in which they would be taught the basic reading writing, mathematical and the general life skills.

As stated earlier in this report, Zorlu has appointed religious teacher to provide Quran education to local females. Again by the involvement of some local NGO, proper measures can be taken by Zorlu to improve the education facilities in the area.

9.1.4. Traditional Home Embroidery

It is required by CCDP that, machines for sewing, stitching, embroidery, and beauty parlor equipment be provided to local females and necessary training should also be provided to females by the company.

It was informed by the Zorlu that sewing machines have been provided to the females in some areas of Jhimpir union council. Further implementation of this priority area of CCDP requires some local NGO to play coordination role.

9.1.5. Communication/Transport

As reported in CCDP, there is no facility of transport available in the area. Consequently in case of any emergency particularly at the time of child birth and other health emergencies, they cannot reach to a nearest hospital which is located at Thatta. Therefore provision of some emergency transport service to take patients to a nearby hospital could be made by the company.

Zorlu do not have some dedicated transport facility for local communities however; in case of medical emergencies ambulance at wind farm is made available to drop the patients to nearby hospital.

9.1.6. Agriculture

According to the recommendations of CCDP, one of the goals of Zorlu's should be to initiate agricultural development programs by providing seeds (cheap and easily available in market) fertilizer to the farmers having small land holding (3 to 5 acres) which really would help them in increasing their income. Focusing on families with small holdings and farmers with three acres or less, it has to introduce a range of options from systems to improve yields to small scale vegetable farming by only providing them seeds could make their life easy.

Zorlu has not initiated agricultural interventions mainly due to lack of communication and coordination with local communities. Again it requires some local NGO to play its role in agriculture sector in coordination with Zorlu.

10. CONCLUSION

Conclusion drawn about environmental performance after monitoring of Zorlu Wind Farm is given below in annotated form;

1. ZEPL is well conscious of the environmental and social considerations and relevant laws/regulation.
2. ZEPL has made considerable arrangements related to environmental and social aspects of the project.
3. Overall environmental performance of Zorlu Wind Farm and compliance with EIA and ESMP is quite satisfactory.
4. However, there are few minor areas like Solid waste management, sewage handling and workplace health/safety, which need improvement.
5. An advanced Firefighting system is installed but it is under process of maintenance. It is advised to expedite maintenance activity.
6. AC's installed in battery room to maintain temperature was NOT working at O&M Control building.

11. RECOMMENDATION

Recommendation for improvement of environmental performance at Zorlu Wind Farm is given below in annotated form;

1. Solid waste dump site needs to be properly constructed. All types of solid waste are dumped at open dumping ground in vicinity of wind farm. Most of the recyclable waste including empty water bottles is collected by local waste scavengers and sold to the nearby scrap market at Jhimpir.
2. Environmental awareness and capacity of workers need to be further improved which can be achieved through regular environmental trainings of staff working at site. HSE manager (Shahid Ali) be nominated/sent for HSE training to fulfill EMP requirement. Subsequently, he will act as Master Trainer and will give training to laborers/workers and O & M employees at project site.
3. It is felt that community is not being represented properly in CCDP. Therefore, it would be appropriate that one or two co-opted member be taken from community in grievance redressal committee
4. Firefighting system be made operational by completing maintenance as early as possible. Firefighting drills be conducted on regular basis and be reported accordingly.
5. AC's of battery room be made operational.

Annexure A
Data Record Plan

Data Record Plan- Compliance Monitoring

DRS No	Project Activity	Impact	Responsibility		Monitoring Frequency
			Monitoring	Execution	
1.	Contractor Mobilization and Demobilization (CMD)	Soil Erosion and Contamination	ESO	Contractor	Weekly and daily during peak activity period
2.	Contractor Mobilization and Demobilization (CMD)	Air Quality Deterioration	ESO	Contractor	Weekly and daily during peak activity period
3.	Contractor Mobilization and Demobilization (CMD)	Noise	ESO	Contractor	Weekly and daily during peak activity period
4.	Contractor Mobilization and Demobilization (CMD)	Safety Hazards	ESO	Contractor	Daily
5.	Contractor Mobilization and Demobilization (CMD)	Damage to Infrastructure	ESO	Contractor	Weekly and daily during peak activity period
6.	Construction Camp Establishment and Operation (CCEO)	Soil Erosion / Contamination	ESO	Contractor	Weekly and daily during peak activity period
7.	Construction Camp Establishment and Operation (CCEO)	Air Quality Deterioration	ESO	Contractor	Weekly and daily during peak activity period
8.	Construction Camp Establishment and Operation (CCEO)	Surface Water Contamination	ESO	Contractor	Weekly
9.	Construction Camp Establishment and Operation (CCEO)	Water Consumption	ESI	Contractor	Weekly
10.	Construction Camp Establishment and Operation (CCEO)	Loss of Vegetation	ESI	Contractor	Weekly
11.	Construction Camp Establishment and Operation (CCEO)	Noise	ESI	Contractor	Weekly and daily during peak activity period
12.	Construction Camp Establishment and Operation (CCEO)	Safety Hazards	ESI	Contractor	Daily
13.	Construction Camp Establishment and Operation (CCEO)	Social and Gender Issues	ESI	Zorlu	Weekly and daily during peak activity period
14.	Transportation of Equipment and Construction Materials (TECM)	Soil Erosion and Contamination	ESI	ESO	Weekly and daily during peak activity period

15.	Transportation of Equipment and Construction Materials (TECM)	Air Quality Deterioration	ESI	ESO	Weekly and daily during peak activity period
16.	Transportation of Equipment and Construction Materials (TECM)	Noise	ESI	ESO	Weekly and daily during peak activity period
17.	Transportation of Equipment and Construction Materials (TECM)	Safety Hazards	ESO	Contractors	Daily
18.	Transportation of Equipment and Construction Materials (TECM)	Damage to Infrastructure	ESO	Contractors	Weekly and daily during peak activity period
19.	Construction (C)	Blocked Access	ESO	Contractors	Daily
20.	Construction (C)	Noise and Vibration	ESO	Contractors	Weekly and daily during peak activity period
21.	Construction (C)	Safety Hazards	ESO	Contractors	Daily
22.	Construction (C)	Damage to Infrastructure	ESO	Contractors	Weekly and daily during peak activity period
23.	Construction (C)	Gender Issues	ESI	Zorlu	Weekly and daily during peak activity period
24.	Construction (C)	Sites of Historical, Cultural, Archeological or Religious Significance	ESI	Zorlu	Weekly and daily during peak activity period
25.	Construction (C)	Soil Erosion	ESO	Contractor	Weekly and daily during peak activity period
26.	Construction (C)	Soil Contamination	ESO	Contractor	Weekly and daily during peak activity period
27.	Construction (C)	Air Quality Deterioration	ESO	Contractor	Weekly and daily during peak activity period
28.	Construction (C)	Aesthetic Value	ESI	Zorlu	Weekly and daily during peak activity period

Note: monitoring frequency may be adjusted accordingly with construction progress

DRS No	Monitoring Parameter	Responsibility	Monitoring frequency	Resource Requirement
•	Visual observation of soil erosion	ESI	During routine monitoring	Nil
•	Groundwater quality	ESI	Monthly	Sampling bottles
•	Surface water quality	ESI	Monthly	Sampling bottles
•	Water consumption	ESI	Weekly	Nil
•	Visual inspection of damage to water course, groundwater wells	ESI	Weekly	Nil
•	Visual inspection of exhaust emissions from generators, equipment and vehicles	ESI	Weekly	Nil
•	Visual check for dust emissions from equipment and vehicles	ESI	Weekly	Nil
•	Noise	ESI	Monthly	Noise meter
•	Public grievances	ESI	Monthly	Social complaint register

Data Record Plan- Effect Monitoring

Note: Monitoring frequency may be adjusted accordingly with construction progress

Annexure B
Environmental and Social Monitoring Team

SADIQULLAH KHAN

Mr. Sadiqullah Khan works as an Environmental Expert at Élan Valorisation (Pvt.) Ltd. He holds an MPhil degree in Environmental Science from International Islamic University, Islamabad and Master degree in Botany from Gomal University D.I.Khan. Currently he is a PhD scholar in International Islamic University, Islamabad. He is a professional Environmentalist having the sound experience of conducting Environmental impact Assessment/ Initial Environmental Examination studies of various Construction/Buildings/Industrial Complexes/Hospitals/ Power Plants and renewable energy. His major research area is Environmental Governance in Pakistan. He has deep knowledge and command over the National and International environmental Legislation/Policies/ Environmental Agreements and National and International Environmental Institutional arrangements.

SHAMSA NAZ

Ms. Shamsa Naz works as an Environmental Expert & Assistant Energy Specialist at Élan Valorisation (Pvt.) Ltd. Her M.S degree is in “Energy Management” from Comsats institutes of information and technology Islamabad. She completed her Master degree in Environmental Science from International Islamic University, Islamabad. Her major research area is Energy and Environment in Pakistan. She has deep acquaintance over the National and International Environmental Legislation/Policies/Environmental Agreements and National and International Environmental Institutional arrangements. She also have an interest in the social aspects of various project activities.

KOMAL SIDDIQUE

Ms. Komal Siddique works as an internee at Élan Valorisation (Pvt.) Ltd. Her M.S degree in Environmental Sciences is in progress from National University of Science and Technology (NUST), Islamabad. Her M.S. research is on application of nanotechnology in agriculture. Thesis writing and publication is in progress. She has completed her Master degree in Environmental Sciences from International Islamic University, Islamabad. She has profound insight in Environmental Impact Assessment (EIA), Environmental Management System (EMS) and Natural Resource management (NRM). Her major research area is Environment and Nanotechnology. She has an interest in National and International Environmental Legislation/Policies and Environmental Agreements.

YAWAR ABBAS

Mr. Yawar Abbas works as an Environmentalist at Élan Valorisation (Pvt.) Ltd. He holds MPhil degree in Environmental Sciences from Government College University Faisal Abad. He has done B.S Geology degree from University of the Punjab, New Campus Lahore. His core research areas are Health, Safety and Environment

(HSE), Environmental Impact Assessment (EIA) / Initial Environmental Examination (IEE); He also has experience regarding environmental monitoring. He has deep acquaintance over the National and International Environmental Legislation/Policies/Multilateral Environmental Agreements (MEA's) and National and International Environmental Institutional arrangements.

List of Professionals indirectly involved in Project:

S. No.	Name	Specialization	Position in the Project
1.	Muhammad Ziauddin	Electrical Engineer	Chief of Party
2.	S Anwar Raza	Admin & Finance	Coordinator
3.	Naveed Ul Haq	Town Planner & Environmentalist	Team Leader
4.	Muhammad Rameez Awan	System/Web Administrator	Report Formatting

Annexure C
Accident Report Form

ZORLU O&M <small>POWERPLANTS OPERATION AND MAINTENANCE</small>	DOCUMENT NAME	ACCIDENT REPORT FORM	PUBLICATION DATE	00.00.2014
	DOCUMENT NR.	ZOM-PAK-10.001	REV. NR.	
	DEPARTMENT	Zorlu O&M Pakistan Wind Farm	REV. DATE	
	PAGE NR.	1 / 2	REV. REASONS	

Details of Person completing the form			
Name			Date
Job title			
Accident	Dangerous occurrence	Near Miss	Illness
Details of Injured Person			Age/DOB
Address of Injured Person			
Telephone:			Occupation;
Employers Name			
Managers Name			Telephone
Company Address:			

Accident Details	
Location of Accident/Incident	
What work was occurring at the time of accident:	
Summary of the accident and the injury caused (part of body and severity): (attached additional pages if necessary)	

PREPARED BY	CONTROL BY	APPROVED BY

ZOM-PAK-X1.00_Rev.0

ZORLU O&M <small>POWERPLANTS OPERATION AND MAINTENANCE</small>	DOCUMENT NAME	ACCIDENT REPORT FORM	PUBLICATION DATE	00.00.2014
	DOCUMENT NR.	ZOM-PAK-10.001	REV. NR.	
	DEPARTMENT	Zorlu O&M Pakistan Wind Farm	REV. DATE	
	PAGE NR.	2 / 2	REV. REASONS	

Who witnessed the accident? (state names, employer, and contact details)

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First Aid Details:

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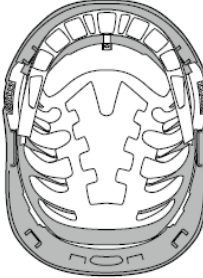

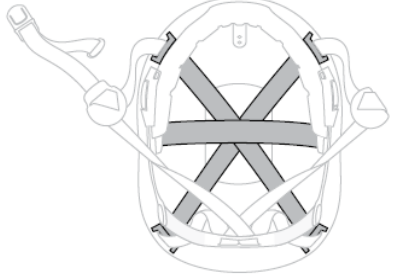
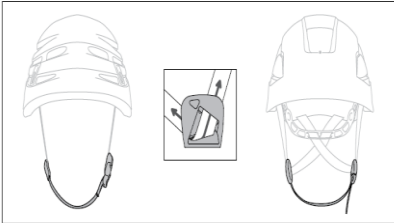
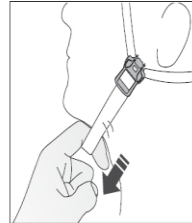
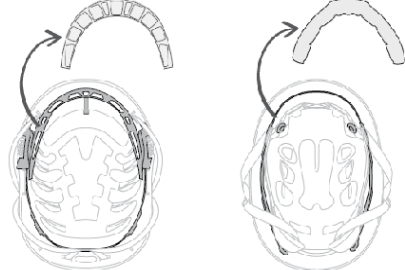
For Office Use Only

Accident Category	
Follow up Action	

PREPARED BY	CONTROL BY	APPROVED BY

ZOM-PAK-X1.00_Rev.0

Annexure D
PPEs Inspection Sheet

ZORLU O&M PAKISTAN WIND FARM FALL PROTECTION (LADDER AND RAIL) CONTROL FORM				DOC: ZOM_PAK_F4.09.Rev01			
<div style="border: 1px solid black; height: 100px; width: 100%;"></div>			<div style="border-bottom: 1px solid black; padding-bottom: 5px;">ETZL) visual</div> <div style="border-bottom: 1px solid black; padding-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; padding-bottom: 5px;"></div>		<div style="border-bottom: 1px solid black; padding-bottom: 5px;">ing test according to the ma</div> <div style="border-bottom: 1px solid black; padding-bottom: 5px;">s</div> <div style="border-bottom: 1px solid black; padding-bottom: 5px;"></div>		<div style="border-bottom: 1px solid black; padding-bottom: 5px;">sE</div> <div style="border-bottom: 1px solid black; padding-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; padding-bottom: 5px;"></div>
Checking the shell		Checking the adjustment system		Checking the liner			
							
Checking the chin strap				Checking the headband			

Responsible Department :	Zorlu O&M Pakistan Wind Farm		
Turbine no:			
Lift NO. :			
Model No:/Type	VERTEX® ST		
Manufacturer / Dealer :	PETZL		
Testing Date:			
Purchase Date :			
Test Period	PPES will be checked by visual and functional inspection in every use. Every 3 months the fall protection system checked by visual and functional inspection form will be filled. Control form, Mechanical Engineer, HSE Specialist and user will be signed.		
1.Control		Date:	
Controle By	HSE Specialist	User	
2.Control		Date:	
Controle By	HSE Specialist	User	
3.Control		Date:	
Controle By	HSE Specialist	User	
4.Control		Date:	
Controle By	HSE Specialist	Inspection by	

	1.Control		2.Control		3.Control		4.Control	
Checking Criteria	OK	NOT OK	OK	NOT OK	OK	NOT OK	OK	NOT OK
1. Is the HELMET is in useable condition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A.Preliminary observations								
Verify the presence and legibility of the serial number and the CE mark	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verify that the product lifetime has not been exceeded.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B.Checking the shell								
Check the condition of the outside of the shell (marks, impacts, deformation, cracks, burns, wear, signs of chemical products)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Check the condition of the inside of the shell (marks, deformation, cracks, missing parts...). WARNING: do not remove the liner that is attached to the shell.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the condition of the slots and holes for mounting accessories (deformation, cracks...).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the condition and function of the ventilation shutters (for VERTEX VENT, ELIOS...).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Remember: personalizing or marking the helmet must not be done with chemical products. Use water-based adhesives for any marking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

C. Checking the liner & Checking the cradle (webbing head harness)								
Check the condition of the liner (marks, deformation, cracks, missing parts...). Remove the comfort parts to inspect the hidden areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the condition of the straps and their attachments to the shell (wear, cuts, burns, deformation of plastic pieces).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Need to repair or replace with new one	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Suspension/Wires/Cable								
Suspension	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Derive wire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

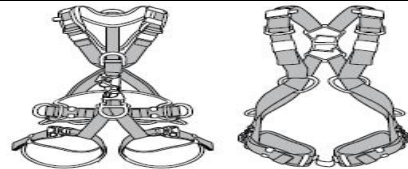
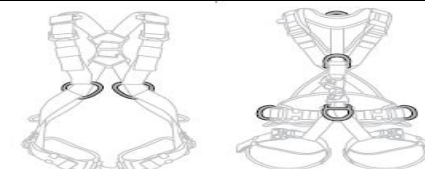
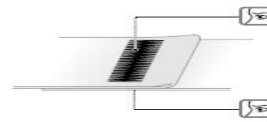
Safety wire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Guide wire and attachment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power/Control cable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Checking the headband and Checking the adjustment system								
Check the condition of the headband and its attachments to the shell (wear, deformation, missing parts...). If necessary, remove the foams or comfort parts to inspect the hidden areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the condition of the adjustment system and its attachments to the shell (wear, deformation, missing parts...).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the function of the adjustment system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

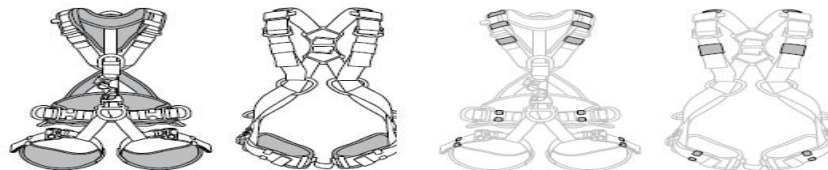
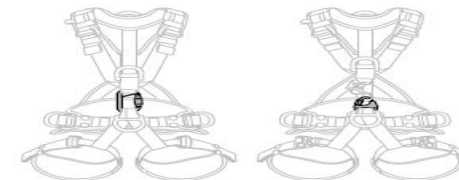
Operate the adjustment system in both directions. Pull on the system to verify that it does not lose its adjustment setting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Checking the chin strap and Checking the comfort foams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the condition of the chin strap and the adjustment parts (wear, cuts, burns, deformation of plastic pieces). Move the keepers and plastic pieces to inspect any hidden areas on the straps.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the condition of the chin strap buckle (wear, deformation, breakage). Test the reliability of the fastening by pulling gently on the chin strap.								
Check the condition of the comfort foams. If necessary, remove them for washing or replacement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Control results								
Helmet is safe for use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspection Date:								
Next Inspection Date:								
If the HELMET use is prohibited, mark the as faulty or damage.								

**ZORLU O&M PAKISTAN WIND FARM
 FALL PROTECTION (LADDER AND RAIL) CONTROL FORM**
DOC: ZOM_PAK_F4.09.Rev01

This control form prepared for FULLY BODY harness visual and functional performing test according to the manufacturer's instructions and HSE regulations.

Control Positions

Checking the condition of the straps

Checking the attachment points

Checking the condition of the adjustment buckles

Checking the condition of the comfort parts

Checking the condition of the chest/seat harness connector

Responsible Department :	Zorlu O&M Pakistan Wind Farm		
Turbine no:			
Lift NO. :			
Model No:/Type			
Manufacturer / Dealer :	AVANTI		
Testing Date:			
Purchase Date :			
Test Period	<p>Fall protection system (FPS) will be checked by visual and functional inspection in every use.</p> <p>Every 3 months the fall protection system checked by visual and functional inspection form will be filled.</p> <p>Control form, Mechanical Engineer, HSE Specialist and user will be signed.</p>		
1.Control		Date:	
Controle By	HSE Specialist	User	
2.Control		Date:	
Controle By	HSE Specialist	User	
3.Control		Date:	
Controle By	HSE Specialist	User	
4.Control		Date:	
Controle By	HSE Specialist	Inspection by	

	1.Control		2.Control		3.Control		4.Control	
Checking Criteria	OK	NOT OK	OK	NOT OK	OK	NOT OK	OK	NOT OK
1. Is the service lift is in operational condition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A.Checking the condition of the straps								
Check for cuts, swelling, damage and wear. Check the waist belt straps, leg loops, leg loop/waist belt linkage and shoulder straps,	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the condition of the safety stitching on both sides. Look for any threads that are loose, worn, or cut. The safety stitching is identified by thread of a different color than that of the webbing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Checking the attachment points								
Check the condition of the metal attachment points (marks, cracks, wear, deformation, corrosion...).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Check the condition of the textile attachment points (cuts, wear, tears...)	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All attachment points are sustainable loads	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Checking the condition of the adjustment buckles								
Check the condition of adjustment buckles (marks, cracks, wear, deformation, corrosion...)	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verify that the buckles operate properly.	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check that the straps are correctly threaded, with no twists	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Checking the condition of the comfort parts								
Check the condition of the waist, leg and shoulder foams (cuts, wear, tears...).	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the condition of the elastic and/or plastic keepers (cuts, wear, tears...)	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Check the condition of the leg loop elastics (cuts, wear, tears...).	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the condition of the equipment loops (cuts, wear, tears...)	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Need to repair or replace the harness with new one	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E.Checking the condition of the chest/seat harness connector								
For connector inspection, see the inspection form for your connector	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If the harness features a chest/seat harness connector, make sure that it is present.	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verify that the connector is correct model and that it is correctly attached to harness.	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Check the condition of the textile attachment bridge (cuts, wear, tears...). For attachment bridges made of rope:	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Check the condition of the gated rings (marks, cracks, wear, deformation, corrosion...)	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Verify that the screw is properly tightened	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Make sure the rope has no cuts, burns, frayed strands, fuzzy areas, or signs of chemical	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Control results								
HARNESS safe for use	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspection Date:								
Next Inspection Date:								
If the Fully body harness use is prohibited, mark as faulty or damaged								

Annexure E
Zorlu O&M Training Record Sheet

Training Record Sheet Till 2016

ZORLU O&M TRAINING RECORD SHEET							
S.NO	TRAINING COURSE	INSTITUTE/COMPANY	Sart Date	End Date	DURATION	ATTENDEES	PLACE OF TRAINING
1	VENSYS62 Operation and Maintenance technical training	ZORLU TURKEY	18.01.2009	20.01.2009	3 days	ZOMP	ZORLU SITE JHIMPIR
2	Work at Height (WAH) and PPEs use	IPEK GmbH Consultant	27.04.2012	27.04.2012	1 Day	ZOMP	ZORLU SITE JHIMPIR
3	Work at Height (WAH)	KAYA TRAINING (TURKISH)	04.06.2013	6.06.2013	3 days	ZOMP	ZORLU SITE JHIMPIR
4	Fire Fighteing & First aid	CISCO Consultant	28.02.2013	28.02.2013	1 DAY	ZOMP	ZORLU SITE JHIMPIR
5	Health, safety and enviroment	CISCO Consultant	01.03.2013	02.03.2013	2 Days	ZOMP	ZORLU SITE JHIMPIR
6	Root cause failure analysisi of bearing	SKF pakistan	29.12.2014	30.12.2014	2 Days	Shahid Ali Nadeem hussain	SKF training center Karachi
7	HSE and Risk assesment	Institute of Enviroment Engineering and Management	29.03.2014	20.4.2014	5 Days	Shahid Ali	Mehran UET jamshoro
8	Basic Safety Training	VESTAS	12.02.2015	12.02.2015	12 Hours	ZOMP	ZORLU SITE JHIMPIR

Annexure F
List of Local Employees at Zorlu Wind Farm
(O&M Phase)

Full Name	Mr / Ms.	Department	Duty Place	Gross Salary Pak Rupees
Muhammad Rahim	Mr.	Administration	SO	17,820
Zulfiqar Ali Brohi	Mr.	Administration	SO	17,820
Wahid Bux Jhakro	Mr.	Administration	SO	9,504
Noordin Gango	Mr.	Operations	SO	15,015
Ghulam Mustafa	Mr.	Operations	SO	15,015
Abdullah	Mr.	Operations	SO	15,015
Allah Wasayo Brohi	Mr.	Operations	SO	13,056

Full Name	Mr / Ms.	Department	Duty Place	Gross Salary Pak Rupees
Ghulam Umar	Mr.	Operations	SO	23,760
Shahnawaz	Mr.	Operations	SO	17,820
Liaquat Ali	Mr.	Operations	SO	20,493
Ijaz Ali	Mr.	Operations	SO	15,015
Azeem Muhammad	Mr.	Operations	SO	15,015
Mehboob Ali	Mr.	Operations	SO	15,015
Jamaluddin Brohi	Mr.	Operations	SO	15,015
Muhammad Soomar	Mr.	Operations	SO	13,056
Aijaz Ali	Mr.	Operations	SO	13,056

Annexure G

Bird Monitoring

Introduction

By: Zahid Baig Mirza

Bird monitoring assignment was taken up as part of EIA due to location of this wind energy farm. It is about 5km from Keenjhar Lake Wildlife Sanctuary where migratory waterfowl overwinter and many local birds also breed in the area. Additionally, project area comes within the range of occurrence of some bird species of concern, both locally as well as internationally. Even though many birds may not be the species of concern, yet these need to be '**monitored for their collusion**' with wind turbines and power lines. Other information needed was impact of disturbance on bird diversity, density and behavior during construction work and afterwards from the running activities of the WEF. More over since high towers of wind energy turbines are being erected in Pakistan and particularly in this area for the first time, there is no information regarding response of birds towards these structures. There is a significant number of bird species that have the ranges of occurrence that cover Jhimpir WEF. This includes; flocks of water birds and other Passerine birds that just fly pass over WEF site. It was not known how many of these birds have their daily rituals to fly from or to Keenjhar Lake. There was no information regarding height at which birds will fly pass over the WEF. Several migratory water bird species are known to have their nocturnal flights. There was no information whether these birds will be flying low or high over this WEF which is in proximity of Keenjhar Lake.

Monitoring Methodology

This bird monitoring requires special methodology to give reliable scientific observations to properly interpret the impacts of the project on both the migratory bird species as well as the local bird species. The proper monitoring task requires internationally acceptable monitoring plan, which was carefully written.

As first step, the author of this document visited project area on 16th February, 2012 to observe transmission lines, transmission towers, fences of enclosures, new buildings of the offices with some newly planted trees and the high towers of wind turbines, some of which were already erected while erection work for more towers was in progress. Only three wind turbines were functioning. The monitoring area and the 'control area' were located on ground on the basis of a noise map provide by the company. A bird observer was recruited. He was given three day training to identify birds in the field with the help of a Field Guide to the birds of Pakistan.

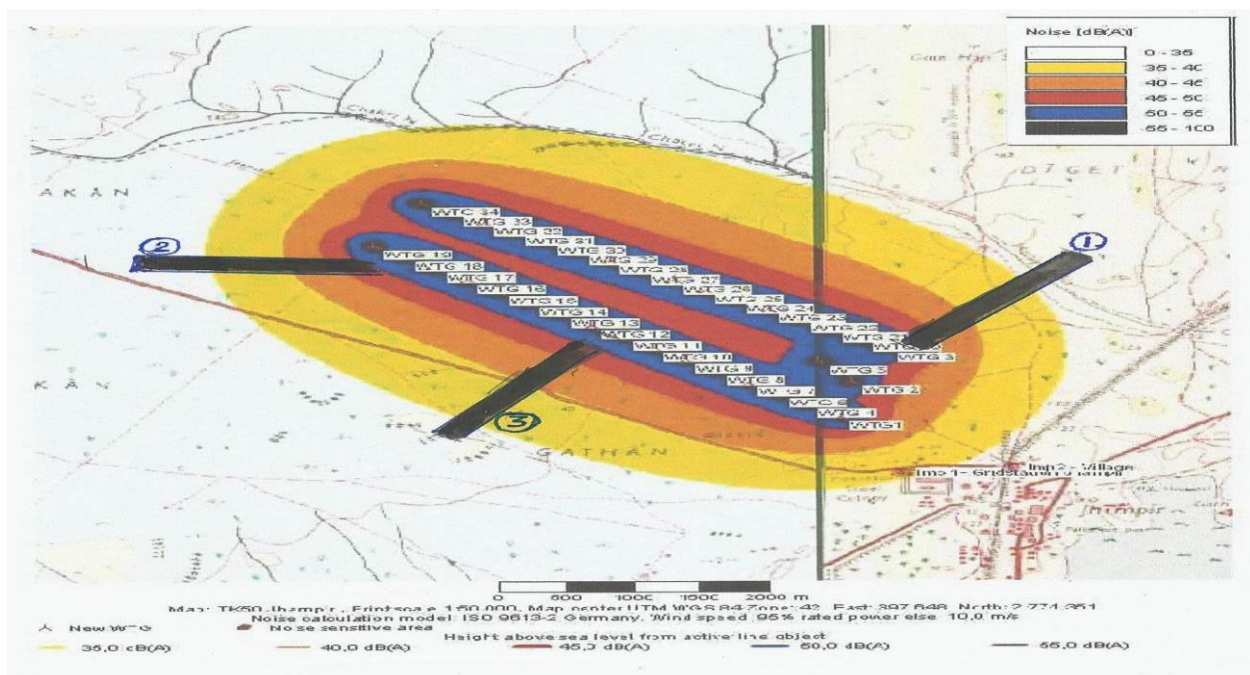
Three sampling plots were marked on the map (map attached) as well as on the ground. Each plot of two km covered noise intensity range from the turbines into zero noise area (control area up to half a kilometer). The bird observations were made after sunrise in the morning and about one hour before sunset each day punctually and regularly. Birds were watched 25m on left and right sides, as well as in front and overhead while moving at a slow/medium pace in linear samples marked on ground. The observations were repeated every day throughout the year.

A good quality binocular, 'A Field Guide to Birds of Pakistan', a pen and a field notebook was given to the bird observer for use during the fieldwork. Migratory birds were also watched from a vantage place marked in the study area once a week. The general directions of the flocks were noted and their flight heights during the autumn, winter and spring seasons were estimated. There was a periodic search for dead birds early in the morning near the moving turbines. The following field Performa was daily filled to make the daily observation reports:

1. Date;
2. Sampling Strip #
 - a). Observations in noise zone:
 - b). Observations in control area:
3. Start time;
4. Weather: Clear sky, hazy, partly cloudy, cloudy, drizzle, rain.
5. Wind: Still, light, slow, medium, fast.
6. Air temperature:
7. End time
8. Additional observations/ remarks

This included the birds sighted within the noise area and the birds sighted in the control area. Each month's reports were then sent to author. The data was transferred on spreadsheets and recorded in the computer as well. The data was processed to calculate density, diversity and relative abundance of the bird species.

Strip sample sites # 1, 2 and 3 marked on the noise intensity map



Bird Monitoring Findings during 2014

- There was no incidence of bird collusion with static or moving blade of any wind turbine.
- The diversity and density of species of birds, on the average remained the same in the three linear sites within the noise disturbance zone and the three linear samples outside the noise disturbance zone. This means either the birds are adapted to the new environment with the turbines' normal working or the noise intensity of the turbines does not bother the birds.
- It was found that no flock of birds passed low over the Turbine Towers. During bird migration season flocks birds were sighted quite high (above 500 ft. or more) over project site. The regular observations have given the confidence that these towers are not causing any risk of collusion to birds or the bats.
- The study has provided a checklist for birds of the area. This checklist indicates that there is no threatened species of birds occurring in the area. There is no question of any risk of mortality to them by virtue of this project.
- So far no regular flyway of migratory birds was noted above the project site.
- There were no daily flight paths of local birds between their roosting places and feeding areas over the project site.
- Early morning searches for the bodies of collided birds give clear picture of the harmfulness of the project for birds. Based on these findings it is concluded that there are least bird mortality risks.
- Some flocks of birds feed in the project site but caused no risk of colliding with the moving turbine blades.
- There is no exciting/alarming information that may be highlighted in this brief.

ZORLU ENERGY FARM JHIMPIR BIRD COLLUSION RISK STUDY COCLUDING STATEMENT

December 31, 2015

By Prof. Z. B. Mirza*

*Consultant ornithology and bird ethology Élan Valorisation Pvt. Limited

This concluding statement is based on 18 months vigilance of the migratory as well as sedentary species of birds, at the entire land where power generating 120 ft high turbine towers stand with their 30 ft long rotating blades. This Wind Energy Farm (WEF) is situated in one of those 'Wind Corridors' of Sindh where no mist prevails in any season. The number of rounds of the turbine blades was 16 per minute as counted during the day. Although Khinjer Lake is 5 km from this wind energy farm yet very few waterfowl flocks were seen, which were very high against the expectations. It is in the consultant's observations that the flocks of migratory birds, particularly the ducks approaching the lake, come flying high and before landing circle over the lake to select area for landing. These then descend for landing at the selected place. The migratory birds cross flying high over the wind turbine towers. It appears the area of the Wind Energy Farm is not significantly covered by a fly way of migratory birds as per observations during the study period. The migratory birds real corridor is further south, mostly along the coast. Khinjer Lake with extensive commercial fishing is now a disturbed area for birds. Moreover, introduction of grass carps has caused reduction in bottom flora and ultimately poor aquatic food chain. Less food availability at the bottom of the lake does not attract bottom grazing birds. Reduced concentration of phytoplankton, zooplankton and macroinvertebrates in the shallow waters of the edges of the lake has less attraction for dabbling ducks and waders. Fewer birds means lesser amounts of bird droppings, low nitrate and phosphates, less fertility of bottom, less floral growth and poor food chain. This lake has become less suitable for aquatic birds over the half century. It could be one of the causes of its being less attractive for migratory water birds. Thus the Zorlu WEF has least traffic of migratory bird over its air.

Annexure H
QHSE Policy for O&M Phase

Approved By:

QHSE Policy



We are committed to achieve consistent level of satisfaction to our stakeholders,

contractor and customer through continual improvement in the quality of our services.


Based on Zorlu Energy's vision and values, we strive to produce energy through wind that enhancing national power supplies by focusing on our customers, employees, society and the environment in which we operate.

Zorlu O & M Top Management & its employees shall endeavor to ensure the satisfaction of our stakeholders by providing them with the best value in services, while recognizing that Quality, Health, Safety, Environment & Community Responsibilities are an integral part of our operation.

We shall achieve QHSE aims by:

- Ensuring that our customers are satisfied and to advice on appropriate use of green energy.
- Providing a frame work for establishing and reviewing QHSE objectives.
- Developing and implementing management Structure and procedures at all workplaces.
- Monitoring, Evaluating & continually improving QHSE performance through assessment, trainings and audit.
- Recognizing that QHSE is directly everyone responsibility.
- Making top Management, Sr. Engineers and Technicians responsible for QHSE Management System implementation & improvement.
- Promoting healthy and safe working environment through prevention of injuries and work-related illnesses
- Continuously minimise resource consumption and measure environmental impact
- Fully abiding by applicable legislative requirements related to QHSE.
- Communicating QHSE Policy to all stakeholders.
- Training and encouraging behavior that upholds the Policy.

Annexure I
Risk Assessment Sheet

		FORM NO: 2 REV NO: 0
RISK ASSESMENT		
Work permit number:		Date :
DEFINITION OF RISK		
<input type="checkbox"/> Working height	<input type="checkbox"/> Crash	<input type="checkbox"/> Springing particules
<input type="checkbox"/> Electric	<input type="checkbox"/> Tripping	<input type="checkbox"/> Noise
<input type="checkbox"/> Falling objects	<input type="checkbox"/> Confined space	<input type="checkbox"/> Poison
<input type="checkbox"/> Lifting operation	<input type="checkbox"/> Heat stress	<input type="checkbox"/> High Oil pressure
<input type="checkbox"/> Excavation works	<input type="checkbox"/> Rotary machine	
<input type="checkbox"/> Other	<input type="checkbox"/> Fire	
Precaution		
Proper PPE		
<input type="checkbox"/> Helmet	<input type="checkbox"/> Slider	<input type="checkbox"/> Safety glasses
<input type="checkbox"/> Harness	<input type="checkbox"/> Glove	<input type="checkbox"/> Shock absorber
<input type="checkbox"/> Mask	<input type="checkbox"/> Ear plug	<input type="checkbox"/> Safety boot
<input type="checkbox"/> Others		
Prepared by		Approved by

ZORLU PAKISTAN WIND FARM RISK ASSESMENT FORM O&M - 2011

ZORLU O&M**ZOROM-TBN-03- EMERGENCY RESPONS PRCEDURE TURBINE**

PAGE : 1 / 11

Rev. : 0/ 01.05.2015

<u>PREPARED</u> <i>SHAHID ALI</i>	<u>APPROVED</u> <i>MUSHTAQ AHMED</i>
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Rev.	Date	Pages	Revised Description
0	01.05.2015	ALL PAGES	-----

1. PURPOSE

To purpose of this procedure is to develop a system, provide instructions, and assign responsibilities whenever dealing with emergencies.

Zorlu O & M commits resources and funding necessary to implement appropriate emergency preparedness programs/drills.

2. SCOPE

This document minimum covers the following areas.

1. Fire
2. Environmental accidents
3. Turbine incident
4. Escape routes and rally points
5. Evacuation and rescue procedures for turbine
6. Locations of equipment such as:
 - Fire extinguishers
 - First aid kits
 - Eyewash stations or showers
 - Environmental kit
 - Rescue devices
 - Stretcher
7. Shelters for severe weather events/earthquakes/lightning
 - Emergency alarm procedure including:
 - Communication system (radio, cellular phones, etc.)
 - List of relevant phone numbers for:
 - Emergency services
 - Local environmental authorities
 - Location of turbine

Annexure J
Site Photographes

Figure A-1: A view of Zorlu Wind Farm



Figure A-2: A View of Zorlu Control Room Building



Figure B-2: Review and Checking of DRS (Date Record Sheets) of Zorlu Wind Farm



Figure B-1: Meeting with O&M Contractor



Figure C-2: Inspection of First Aid Box Mounted at the Wall

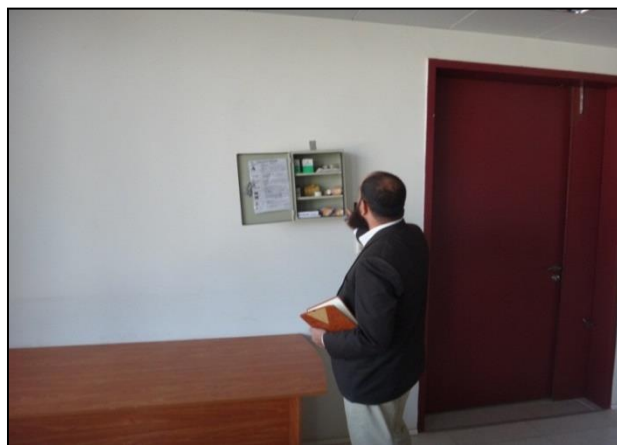


Figure C-1: Inspection of Control Room Building



Figure D-2: Fencing around Generator Site Located at Operational Camp**Figure D-1: Solid Waste Collection and Segregation at Control Building****Figure E-2: Septic Tank for the Disposal of Waste Water Demanding High Intension****Figure E-1: Properly Covered Septic Tank at Control Building****Figure F-2: Fire Extinguisher Placed at an Improper Location****Figure F-1: Inspection of Kit and Bag of PPEs (Personal Protective Equipment)**

Figure G-1: Inspection of Segregated Solid Waste at Zorlu Control Building



Figure G-2: Broken Stretcher needs to Be Repaired or Replaced



Figure H-1: Maintenance Work in WTG by using PPEs



Figure H-2: Inspection of MSDS on Chemical Drums



Figure I-2: Inspection of Health Facility Available at Zorlu Camp Site Office



Figure I-1: An Equipped Ambulance Available at Zorlu Camp Site Office

