Environmental and Social Monitoring Report

Project Number: 43937-014
Final Yearly Report 2014
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Pakistan: PAK: Zorlu Enerji Power Project

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

Zorlu Wind Power Project

Environmental and Social Monitoring Report

Final Yearly Report 2014

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Prepared for

Zorlu Enerji Pakistan Limited

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Report disclaimer:

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. PROJECT NAME AND SUMMARY INFORMATION

1.1 Project Introduction

ZORLU ENERJI is considered to be one of the experienced members of electricity generation and distribution market of the world. With presence in many countries of the world; ZORLU decided to enter the renewable energy sector of Pakistan by installing a wind power plant at Jhimpir, District Thatta of Sindh Province.

The initial capacity of the Project was 49.5 MW comprising of 5x VENSYS 62, 1.2 MW each which was later enhanced to 56.4MW comprising of additional 28x VESTAS V90, 1.8 MW each. 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. Total land area of the Zorlu Wind Farm comprises 1,300 acres of land.

Construction of the Zorlu Wind Farm was started during March, 2012 and is under commercial operation since June, 2013. At present, Zorlu O&M Pakistan Ltd is the Operation and Maintenance (O&M) contractor of the wind farm.

1.2 Project Location

The project site 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. Access to the site is possible trough well prepared public roads as well as by using the rail way. Project site is accessible through Super Highway as well as through National Highway.

1.3 Environmental and Social Monitoring

Environmental Impact Assessment (EIA) and Environmental and Social Management Plan (ESMP) for construction phase of the Zorlu Wind Power Project were prepared and approved by Sindh-Environmental Protection Agency (Sindh-EPA) in 2008 (first phase) and 2012 (second phase) Bird Monitoring Plan (BMP) and Comprehensive Community Development Plan (CCDP) as suggested in EIA report, were developed and approved in 2012. Under the national and international environmental laws and regulations, project developer (Zorlu Enerji Pakistan Ltd) is required to implement all the environmental and social plan for all project phases i e pre-construction, construction and operation phases and its monitoring is to be done by an independent agency. Accordingly the Élan Partners (Pvt.) Ltd has been entrusted the assignment for monitoring the implementation of ESMP, EIA and CCDP by the project developer (Zorlu Enerji Pakistan Ltd).

Environmental and social monitoring plan for up to construction phase was adequately implemented. However, ESMP for O&M phase of the project is in

process of development and will be submitted to the project developer (Zorlu Enerji Pakistan) in due course of time, for their approval.

Document in hand is the Environmental and Social Monitoring Report (ESMR) which provides the details of compliance status during O&M phase at Zorlu Wind Farm for the period of one year starting from January, 2014 till December, 2014.

This report highlights the status of environmental performance at Zorlu Wind Farm by documenting the 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 have also been provided in this report. Compliance with approved EIA and ESMP has particularly been documented in the report.

1.4 Élan Valorisation (Pvt.) Ltd- The Consultants

Élan Valorisation (Pvt.) Ltd. is the sister company of Élan Partners (Pvt.) Ltd. which is dedicated to environmental and social studies. Élan Valorisation comprises a well 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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2. RELEVANT ENVIRONMENTAL PERMITS AND COMPLIANCE CERTIFICATES

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. Scanned copies of environmental approvals have been attached at **Annexure A.** It may be noted that the approval by the Sindh-EPA is subjected to specific conditions which are required to be fulfilled by project developer. A few of the conditions of approval and their compliance status have been provided in **Table 2-1** below:

Table 2-1: Conditions of Environmental Approval by Sindh-EPA and their Compliance Status at 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 local people for various skilled and unskilled jobs 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 Partners (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. METHODOLOGY OF MONITORING

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

3.1 Existing Framework of Environmental and Social Monitoring at Zorlu Wind Farm

This section provides the process of environmental and social monitoring which is being carried out during the 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 Environmental Training of Project Personnel

Élan Partners (Pvt.) Ltd. after completing the contractual process with Zorlu Enerji Pakistan Limited imparted the environmental and social training to the key personnel of project developer (Zorlu Enerji) and O & M contractor (Zorlu O&M). Purpose of this training was to provide the general awareness to the project personnel about; sustainable development; purpose and need to environmental assessment (EIA) and Environmental and Social Management Plan (ESMP); purpose and need of environmental monitoring; data collection and reporting procedures. Environmental Health & Safety personnel of O & M contractor were the key focus of this training.

3.1.2 Development of Data Record Sheets

On the basis of existing ESMP, Data Record Sheets (DRS) were developed and communicated to the relevant project personnel. Purpose of DRS is to collect the data on specific environmental and social parameters in accordance with the requirements of ESMP and EIA. Each DRS comprises three columns: i) Actions to be taken regarding compliance with ESMP and EIA; ii) Compliance status of each action at project site; iii) Reasons for non-compliance (if any). It is to mention here that DRS were developed and implemented during the construction phase of project. Whereas; during O & M phase, all data related to social and environmental aspects is recorded by the on-site O & M staff according to the previously developed formats.

3.1.3 Development of Data Record Plan

During the construction phase, environmental data was recorded in DRS as per frequency established in Data Record Plan (DRP). DRP provides the; plan for data recording; responsibilities of various personnel for execution and monitoring of mitigation measures; and monitoring frequencies. This information is based upon and translated from the approved EMP and EIA. Sample DRP is attached at

Annexure B. Again it is to mention that DRP was related to the construction phase of Zorlu Wind Farm.

3.1.4 Data Collection and Reporting

During the operation phase, nominated environmental and social persons at project site (HSE Managers, Environmental and Social Officers and Inspectors) record the monitoring data in DRS as per frequencies suggested in DRP. On the basis of collected data, environmental and social monitoring reports are prepared by the Élan. As stated earlier, during O & M phase relevant data and information is collected by nominated O & M staff and provided to environmental and social experts of Élan at the time of site visit and consultation with project staff.

3.1.5 Site Visits by Environmental Experts

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

- 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 Camp[1];
- 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.

Each site visit comprises the following major activities:

3.1.6 Meeting with Project Personnel

[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.

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 their 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.

3.1.7 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.

3.1.8 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 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;

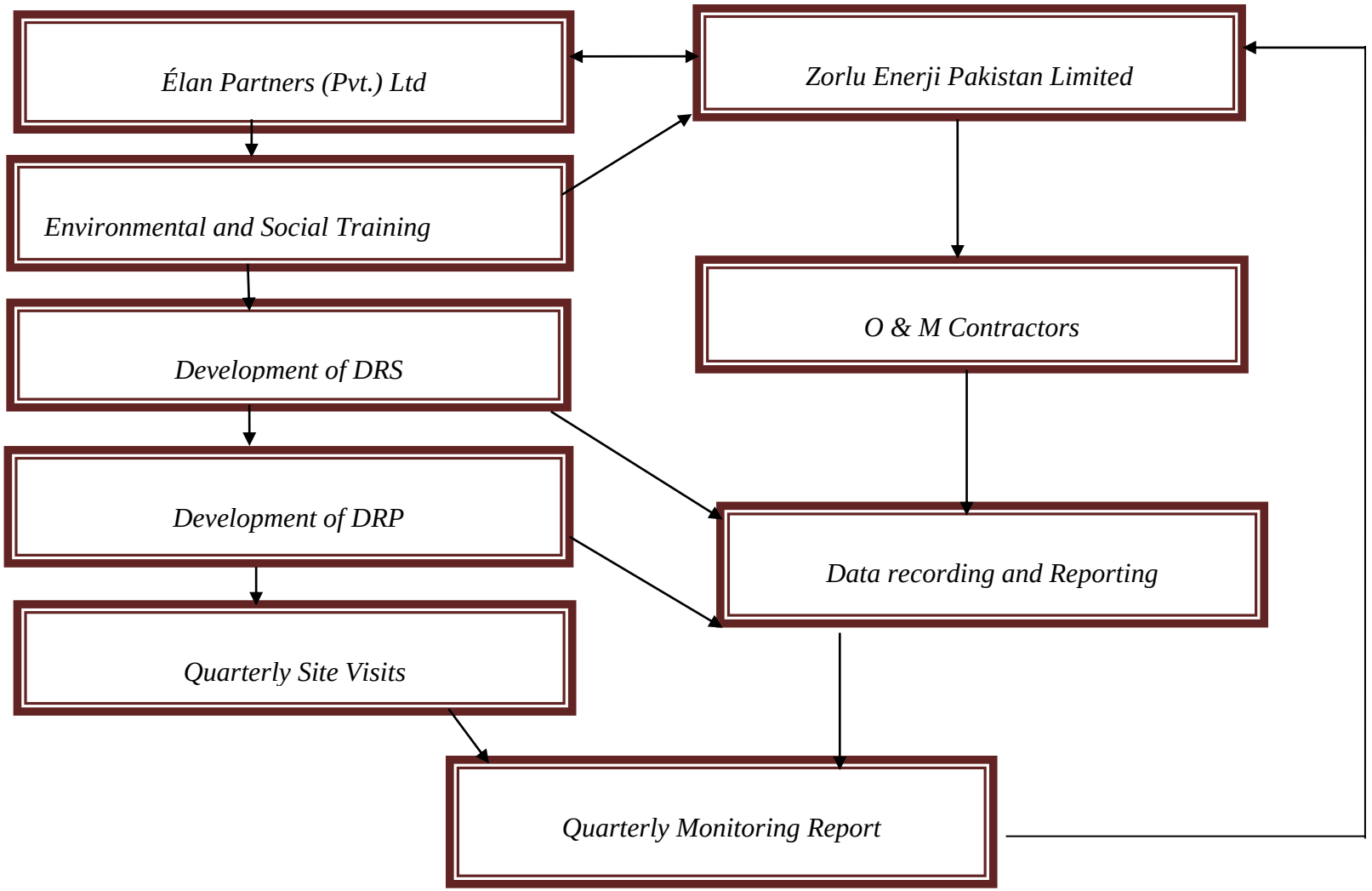
- Health and safety of workers/employees; and
- Community development

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. These 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 C.**

Muhammad Ziauddin	Team Leader
Jamshaid Iqbal	Manager Environment and Resettlement
Aashar Habib	Environmentalist
Maryam Saleem	Environmental and Social Experts
S. Anwar Raza	Coordination and Logistics Officer

4. INCIDENTS OF ENVIRONMENTAL AND SAFETY ACCIDENTS

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 regarding health and safety measures which include: solid waste management and wastewater disposal arrangements need some improvements* as discussed in upcoming sections.

4.1 Incidents of Safety Accidents

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 safety accident. A sample safety accident report form is attached as **Annexure D**. 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. *One thing which was lacking is that the all first aid items and medicines should be listed with expiry dates and this list should be affixed at each first aid box*.

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 E**.

5. LABOR RELATIONS AND CONDITIONS

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 2007[2]

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, 16 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. ENVIRONMENTAL MANAGEMENT CAPACITY

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

O & M Phase Staff

- Environmental and Social Inspector (ESI), Project Developer; (not in place)
- Environmental and Social Officer (ESO), O & M Contractor; (not in place)
- 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.

HSE person is well educated and experienced. He is well aware of the HSE requirements of the project as well as familiar with the basic tools of environmental management, healthy and safety and has sufficient knowledge of relevant national and international environmental laws and regulations.

CV of HSE Manager has been attached at **Annexure F.**

6.1 Environmental and Social Trainings

Although, plan for environmental and social trainings for O&M phase of the project has been prepared but no environmental and social training has been conducted during the reporting period (January, 2014 to December, 2014). This is due to the fact that preparation of ESMP for O&M phase of the project is in process[3].

The planned environmental and social trainings will be aimed to ensure that the requirements of the EIA and ESMP for O&M phase are 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.

[3] ESMP is currently under the process.

7. STAKEHOLDER CONSULTATION/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 it has to be updated. 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 Development Capacity

A Social Mobilizer has been appointed for resolving the social issues associated with O & M phase of Zorlu Wind Farm.

Zulfiqar Ali Brohi-Social Mobilizer

Mr. Brohi is 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.

Mr. Brohi has more than five years of working experience in social sector with adequate capacity of field management, especially in the rural support programs, social mobilization, development issues, including the community development and empowerment of the grass-root development. CV of Mr. Brohi has been attached at **Annexure G.**

7.2 Drinking Water Supply to Local Community

Zorlu provides the drinking water to local communities near project site. Local communities including Brohi, Ganjo, Jakhro and Khaskeli residing near the wind farm site are provided water tankers according to their requirements. Zorlu water tankers are available on call to supply the water to local people. This is an important step towards the implementation of Community Development Plan.

7.3 Promotion of Education among Local Communities

Zorlu is committed to provide input towards the social well-being through promotion of education in the area. At present, Zorlu has appointed a religious teacher at Goth, Brohi who provides 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 had 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. 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. However agreement with KYWDO has expired in 2013 and it has not been revalidated.

7.6 Employment Opportunities for Local Community

Zorlu provides employment opportunities to the local people on priority basis. Total 16 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 I.**

7.7 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. STATUS OF IMPLEMENTATION OF MITIGATION MEASURES IN ESMP

Environmental and Social Management Plan (ESMP) in progression for O&M phase of the project to address the environmental and social requirements of O&M phase. Environmental and social compliance monitoring for O&M phase was awarded to Élan Partners (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 Partners 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 monitoring[4]. 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)[5].

As mentioned earlier, Environmental and Social experts of Élan Partners 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, 2014) 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.

[4] Effect monitoring was the part of ESMP to monitor the effectiveness of mitigation measures proposed in ESMP

[5] 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	• 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.	• AQMP needs some improvements in terms of its contents and format; • Frequency of water sprinkling needs to be enhanced as due to high winds, the area is highly susceptible to dust emissions;
Noise	• Noise Monitoring Plan (NMP) has also been prepared and implemented at relevant project locations; • Noise monitoring is being carried out at relevant locations.	• NMP also requires some improvements in terms of its adequacy and to make it site specific.
Water Quality	• 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. • Refused water from RO plant is mostly used for sprinkling purposes at various project locations where there is the potential for dust emissions.	• Filtration membranes of water treatment plant should be replaced periodically to ensure the better quality water and its record be maintained; • RO waste water collection pond should be properly lined and covered.
Soil Contamination	• 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;	• Polythene sheets used for collection of waste oil should be replaced regularly and record is maintained;

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
Solid Waste Management	• 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 to be sold to some recycling company. • **Annexure J** present the details of solid waste generated at Zorlu Wind Farm during O & M phase. It describes the details such as types and total amount of solid waste generated from various sources, lists of reusable and recyclable waste as well as the methods being used at wind farm for reuse and recycling of waste.	• 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	• 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.	• Septic tanks at O&M camp needs to be properly covered and at O & M control building septic tanks requires vent pipe to be installed to release the exhaust gases.
Flora, Fauna and Bird Monitoring Plan	• 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	• 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.

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
	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 period reporting period is being prepared. The process of bird monitoring and findings of bird monitoring expert have been provided at **Annexure K. Annexure K** also provides the sample bird monitoring sheets and classification and status of birds as per IUCN criteria. • 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 turbines) from far of distance and height.	
Workers Health and Safety	• Zorlu O&M has established and implemented the EHS Plan for O&M phase of the project. EHS plan for O&M phase of the project is attached as **Annexure L**; • 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 camp[6]. 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	• 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

[6] Formerly used as construction camp during construction phase of the project.

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
	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 fire fighting, 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 M;** • Risk assessment sheets are also developed for risk analysis. A sample risk assessment sheet is provided at **Annexure N.** • 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 extinguishers are inspected on monthly basis to ensure that they are working properly; • 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 is provided at **Annexure O;** • 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. EHS regulations of Zorlu O & M have been attached at **Annexure P.**	regular basis.

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
Community safety and security	• 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.	• Unauthorized entries to the wind farm should be strictly prohibited.
CO_2 emissions by the project	• 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 CO_2 emission has least contribution to atmospheric emissions.	• 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.

According to the recommendations of approved EIA, Zorlu Enerji is required to implement the CCDP during O & M phase of the project.

9.1 Priority Areas in CCDP and their Implementation Status

Following priority areas for intervention have been identified in CCDP:

9.1.1. Water and Sanitation

It is suggested in CCDP 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. This could be done an NGO which needs to be appointed.*

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.*

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 any 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. SUMMARY ASSESSMENT OF CLIENT PERFORMANCE AND RECOMMENDATIONS

Zorlu Enerji and Zorlu O&M are well conscious and aware of the environmental and social considerations of the project. Complying with national and international environmental laws and regulations, Zorlu has made considerable arrangements related to environmental and social aspects of the project as discussed in this report. Overall environmental performance of the Zorlu Wind Farm and compliance with EIA and ESMP is quite satisfactory. However there are areas which need further improvements as highlighted in the report. Solid waste management, sewage disposal and health safety issues have been identified as the major areas requiring few improvements. Record keeping of environmental monitoring and HSE matters during O & M phase needs to be further improved. Communication among project developer and construction and O & M contractors also needs to be improved particularly related to environmental, social and HSE related matters. Environmental awareness and capacity building need to be further improved which may be achieved through regular environmental trainings of the project staff at all levels including top management and O & M employees and laborers/workers.

The most important area that lacks immediate attention is of appointment of ESI and ESO, as they will be responsible for day to day monitoring of implementation of environmental and social issues.

As far as the implementation of CCDP is concerned, the consultant is of the opinion that Zorlu management is not giving due weightage to its Social and Corporate Responsibility, though it is a fact that international community is becoming more and conscious on the need of community development. Therefore it is of utmost importance that either Zorlu establishes an in-house system for community development or engage a local NGO as soon as possible.

It will not be out of place to indicate here that other wind farm developers' has started serious thinking with regard to community development. It also been made known to the consultant during site visit that community is getting disturbed for not getting benefits of development in their area. The consultant is highlighting this issue since about a year time.

Annexures

Annexure A

Scanned Copies of Environmental Approvals from Sindh-EPA

Reference No: EPA/S/EPA/2008/4/9/EIA/90

ENVIRONMENTAL PROTECTION AGENCY

GOVERNMENT OF SINDH

Plot # ST-2/1, Sector 23, KIA, Karachi-74900
Ph: 5065950, 5065598, 5065637
5065532, 5065946, 5065621
epasindh@cyber.net.pk
Facsimile: 5065940

Dated: 19-03-2009

DECISION ON ENVIRONMENTAL IMPACT ASSESSMENT (EIA).

1.	**Name & Address of Proponent:**	**M/s Zorlu Enerji Pakistan Limited**
2.	**Description of Project:**	**50 MW Wind Power Project**
3.	**Location of Project:**	**Jhampir, Near Nooribad, Thatta.**
4.	**Date of Filing of EIA:**	**09-04-2008**

5. After careful review and analysis of the Environmental Impact Assessment (EIA) report, the Environmental Protection Agency (EPA), Sindh has decided to accord its Approval subject to the following conditions:

i. During the project execution, safe distances of the under mentioned environmental sensitivities will be maintained:

- 500m from communities, industries and main transport network.
- 300m from community water well.
- 100m from archaeological / cultural site / monument.
- Distance will be measured from the tip blade of turbines or/and transmission power lines associated.

ii. Project activity will not be carried out within buffer zone of any project area designated under Sindh wildlife protection act.

iii. Effect on wildlife will be monitored during the migratory season of birds and reports of findings will be submitted to SEPA.

iv. Campsites will be located at least one kilometer away from any settlement to avoid disturbance to the local people.

v. No industrial or residential activity will be permitted on the land allocated for wind energy projects.

1/3

vii. Employment shall be provided to local people and assured for unskilled jobs. Skilled jobs shall be given to the locals after providing them proper field training, where a minimum training will be required.

viii. Benefits to local people will be offered under Corporate Social Responsibility (CSR) policy, community development schemes will be decided in consultation with local communities and may be facilitated by involving district/local Government office.

ix. Compensation will be provided to the inhabitants in case of loss of agriculture land, crop property, etc., in accordance with the rates that are agreed upon. All conflicting issues regarding compensation etc. shall be settled in advance prior to the start of activity.

x. The allocated land to setup wind energy project should be free from ownership rights of local people.

6. This approval shall be treated cancelled if any of the conditions mentioned in para-5 above is violated. In follow up of the cancellation of this approval prosecution under the provision of Pakistan Environmental Protection Act, 1997 will be initiated against the proponent.

7. The proponent shall be liable for compliance of Regulations 13, 14 and 18 of EIA/IEE Regulation, 2000.

8. The proponent shall be liable for compliance of Regulations 17 of EIA/IEE Regulation, 2000 which permits the authority i.e. Environmental Protection Agency to enter, inspect and monitor the development of the project so that the conditions are effectively monitored.

9. This approval does not absolve the proponent of the duty to obtain any other approval or consent that may be required under any other law in force.

10. Implementation Report of all the mitigation measures and EMP laid down in the IEE Report shall be submitted to this office on quarterly basis for review. No violation of any Regulations, Rules, Instruction and Provisions of PEP Act, 1997, shall be made.

11. All the environmental conditions of this approval shall be incorporated in the terms and conditions of tender document and will be component of health safety and environment policy in the project for commitment and compliance.

12. The relevant organization/proponent will submit separate IEE/EIA to EPA, Sindh for construction of new grid station to cater electricity generation from proposed wind energy project.

Director General

2012/Env/Prof/EEA/174

Dated: 30-4-2012

DECISION ON INITIAL ENVIRONMENTAL EXAMINATION (IEE):

1.	**Name & Address of Proponent:**	Syed Mumtaz Hassan Country Manager M/s Zorlu Enerji Pakistan Limited. C-117, Clifton Block-2, Karachi.
2.	**Description of Project:**	Up Gradation of 6.9 MW Wind Power Project
3.	**Location of Project:**	Jhampir, Near Noorubad, District Thatta.
4.	**Date of Filing of IEE:**	21-04-2012

5. After careful review and analysis of the Initial Environmental Examination (IEE) report the Environmental Protection Agency (EPA), Sindh has decided to accord its Approval subject to the following conditions:

i. During the project execution, safe distances of the under mentioned environmental sensitivities shall be maintained:

- 500m from communities, industries and main transport network
- 300m from community water well
- 100m from archaeological cultural site / monument
- Distance is considered from the tip blade of turbines or and transmission power lines associated

ii. Project activity will not be carried within buffer zone of any project area designated under Sindh wildlife protection act.

iii. Effects on wildlife monitoring during the migratory season of birds and reports of findings shall be submitted to SEPA.

iv. Camp sites shall be located at least one kilometer away from any settlement to avoid disturbance to the local people.

v. No industrial or residential activity will be permitted on the land allocated for wind energy projects.

vi. The project area will be restored to its original nature to the possible extent. For the purpose, documentation (Photographs) will be kept in record.

Annexure B

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

Data record plan- Effect Monitoring

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

Note: Monitoring frequency may be adjusted accordingly with construction progress

Annexure C

Environmental and Social Monitoring Team

JAMSHAID IQBAL

Mr. Jamshaid Iqbal works as Senior Environmental Expert at Elan Partner (Pvt) Ltd. He holds an M. Phil degree in Environmental Science from International Islamic University, Islamabad and Master degree in Soil and Environmental Sciences from University of Agriculture, Faisal Abad. Currently he is a PhD scholar in National University of Science and Technology (NUST), 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.

Mr. Iqbal worked as Senior Environmentalist for preparation of Environmental and Social Monitoring report of Zorlu Wind Farm. He has conducted a number of site visits to collect environmental and social data. He played his role in overall compilation of report.

AASHAR HABIB

Mr. Aashar Habib works as an Environmentalist at Élan Partners (Pvt.) Ltd. He holds B.S Environmental Science degree from University of the Punjab, New Campus, Lahore. Currently he is M.S scholar at University of Sciences and Technology (NUST), Islamabad. His core research areas are Health, Safety and Environment (HSE), Environmental Impact Assessment (EIA) / Initial Environmental Examination (IEE), Environmental Risk Assessment (ERA) and Solid Waste Management. He also has vast 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.

Mr. Habib has worked as an Assistant Environmentalist in Environmental and Social Monitoring of Zorlu Wind Farm. He provided his assistance in compilation of report.

MARYAM SALEEM

Ms. Maryam Saleem works as an Internee at Élan Partners (Pvt.) Ltd. Her M.S degree in Environmental Policy and Management is in progress from Bahria University, Islamabad. She has completed her Master degree in Environmental Science from Fatima Jinnah Women University, Rawalpindi. Her major research area is Environmental Chemistry. She has an interest in National and International Environmental Legislation/Policies and Environmental Agreements.

For the Environmental and Social Monitoring of Zorlu Wind Farm, she visited the project site along with other team members and assisted in report compilation.

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.	Muhammad Rameez Awan	System/Web Administrator	Report Formatting

Annexure D

Accident Report

ZORLU O&M	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 occurence	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

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

First Aid Details:

For Office Use Only	
Accident Category	
Follow up Action	

PREPARED BY	CONTROL BY	APPROVED BY

Annexure E

PPEs Inspection Sheet

PERSONAL ROTECTIVE EQUIPMENTS (PPEs)

S.NO	PPE'S	Ok	NOT OK	REMARKS
1	Harness	✓		Standard – OK Condition – OK Expired – needs inspection
2	Helmet		✓	Needs to change
3	Avanti - Runner	✓		should be inspected by Petzl
4	Lanyard	✓		
5	Positioning Rope		✓	Roof lanyard not available should be EN 358/353-2
6	Safety BOOTS			Should be anti slipping
7	Mechanical gloves		✓	EN 388 CAT II
8	Chemical Gloves			
9	Safety glass			
10	Goggles	✓		
11	Ear muffs	✓		
12	Ear Plugs	✓		
13	face mask			FOR SHIPYARDS, USE MSA RIDER ADVANTAGE 3200
14	Dust Masks			3M COMFORT MASK 3200
15	Positioning Rope			

INSPECTION DATE:	6 - MAY - 2014
INSPECTION BY:	ADEEL KHAN
SIGNATURE :	Adeel

(2) Helmet :- Double triangle, should not have holes over it.
- Chinstrap should be easily openable in emergency condition
- A class
- CE 0082, EN 50365, EN 397, ANSI/ISEA 289.1-2009 type 1 class E

Annexure F

CV of HSE Manager

SHAHID ALI
Mobile: +92-3343941352, 03313444323
Email: Shahid_q4@hotmail.com
shahid.ali@zorlu.com
Present Address: C# 1 KESC colony Gulshan e hadeed ph-1 karachi

Personal Details:

~~Gender~~	~~:~~	~~Male~~
Date of Birth	:	20-02-1984
Nationality	:	Pakistani
Marital status	:	Married
Pass port #	:	CH4912941
Languages	:	English, Turkish, Urdu, Sindhi
Driving	:	Valid Pakistan driving License

Educational Qualification:

Bachelor of Mechanical Engineering - 2006
(4-Years Bachelor Degree)
(Mehran University Of Engineering & Technology)
MSc-Energy system-2012
(NED University of Engineering and Technology

EXPERIENCE

1. ZORLU HOLDING ENERGY PAKISTAN LTD. (TURKISH COMPANY)

From	:	**01-09-2008 to Present**
Organization	**:**	**ZORLU ENERGY PAKISTAN**
Position	**:**	Sr. Mechanical Engineer/HSE Engineer
Department	:	**ZORLU O&M Pakistan**

Role & Responsibilities:

Errection and commissioning with Poland engineers LUSO wind company.
Management of the teams responsible for improving the overall availability and profitability by means of establishing preventative and protective maintenance. Time and task management.
Planning and scheduling maintenance and service activities **(3_6 and Yearly maintenance of VESTAS Turbine)** of wind farm. Organizing and management of technicians and controlling of stock types and level as well
Trouble shooting of **VESTAS 90 1.8/2.0 MW**
Implementation of reliability engineering principles, tools and techniques to identify the plant failures.
Contributes to or potentially causes of production loss or high operating costs, develops, implement reporting systems and scorecards to identify shortfalls in equipment and system performance.

Leading Team of dedicated Engineers & Technicians to Supervise, Coordinate & Control **ZORLU WIND Plant's** Operation & Maintenance in a cost efficient, reliable & safest way through **(SCADA/HMI/PLCs)** system, Installed & commissioned by world leading company **(VENSYS AND VESTAS).**

Team Lead for ZORLU wind farm on Implementation scheduled and routine maintenance work at 56.4 MW and have excellent skills in Asset Management & Work Management Modules

Supervised all Performance Pre & Post Electrical & Mechanical Commissioning Test on **VENSYS 62 WTGs** & Synchronous Generators.

Developed Annual Maintenance Plans for Shutdowns & also contributed in preparing Annual Maintenance Budget

To improve the utilization and associated business processes of the SAP Plant Maintenance module and legacy systems for our operations and maintenance system.

Utilizes technology analysis to achieve reliability and maintenance task improvement.

Improves the uptime and productivity capacity of critical equipment using formalized problem-solving techniques.

The development and implementation of a proactive M&R plan(s) to eliminate maintenance requirements, minimize the use and costs of reactive maintenance.

Responsibilities of HSE Engineer

To implement, review, update and improve the HSE Management system. To improve HSE awareness amongst the workforce.

To organize the Company Safety Incentive Programme.

External Audits ISO 14001 / Monitoring and effective closure of findings.

Subcontractor Approval, audits and measuring performance.

Maintain evaluation of compliance and update of Legal and other requirements related to Environment, Health

Internal Audits (Planning, Monitoring, Evaluation and closeout as per the schedule).

To compile all SOCs and ORs related to Environment (Follow up and effective closer) and analysis on the findings to set corrective action directives.

HSE Internal Trainings and plan weekly internal HSE training as required.

Monthly HSEQ Meeting / follow up with minutes of meeting.

To organize and conduct basic firefighting training and conduct regular.

To oversee, maintain and periodically service all fire-fighting, rescue and emergency response equipment in buildings,

To lead Emergency Response Team and assist in the operation.

Safety Briefing / Induction for visitors.

2. BIN QASIM POWER STATION KESC (BQPS THERMAL POWER PLANT)

From	:	**21-08-2007 to 31-09-2008**
Organization	**:**	**Karachi Electric Supply Company (KESC)**
Position	**:**	**Assistant manager**
Department	:	**Bin Qasim Thermal Power Station Karachi**

Role & Responsibilities:

Carry out routine maintenance & overhauling of rotating and stationary equipments.

Analyze troubleshooting of rotating equipment problems and provide proactive contributions to improve its reliability and durability.

To manage the rotating equipments reliability assurance program especially condition monitoring program (CPM),

To conduct failure analysis, analyze reliability data and improvement plan. To find out the condenser tubes leakage applying the different techniques to increase the efficiency of the plant.

Aim is to load maintenance improvements so that troubles (Repairs, inspections, adjustments, lubrication) during start up and commissioning are minimized.

Over hauling of the BFP pumps

Development Training Programs:

Operation and Maintenance training conducted by ZORLU employees group for VENYS62 Turbine (Germany GmbH)

High rescue training program by German Experts İpek energy consultant (GmbH).

Training of First aid, HSE and ISO 9000-14000 standards conducted by CISCO ltd.

High rescue training attended on site and given by the German experts for VESTAS- 90 turbines (1.8MW)

Technical training of the VESTAS-80 (1.8/2.0 MW)

Advanced Professional Certificate Course in "Health & Safety Environment.

Root cause failure analysis of bearing training by SKF Pakistan.

Technical Internships:

One month internship training at Karachi Port Trust shipyard workshop

One month internship training at Zeal Pak Cement factory Hyderabad

Three weeks internship training at Indus textile Mill.

Communication & Work Relationship Skills:

Having good communication with Executives levels, technical team members.

Introductory level of SAP PM System use in wind power plant.

Having excellent communication skill, competence & ability to delegate. Having good knowledge on relevant with different maintenance procedures. Energetic, self motivated & able to work under minimum supervision.

Team building skills & having problem solving ability.
Excellent report writing & analytical skills.

Annexure G

CVs of Social Mobilizer

Zulfiqar Ali Brohi

Village Haji Salesman Brohi UC Jhimpir P_O Jhimpir Taluka & District Thatta

Cell # 0332-2955864

Email: zabrohi786@yahoo.com

Objective: To be an integral part of a professional and challenging environment where I can develop and groom my professional and personal skills.

Profile:

Zulfiqar Ali Brohi is a social development activist. During professional career ***Mr. Brohi*** have worked in exalted national, provincial and district level organizations to promote primary education, especially for child, running capacity building and skills enhancing activities for communities and focused groups and coordinated with media to sensitizing communities regarding sociopolitical, socioeconomic and gender issues.

Having more than five years experience in social sector with good capacity of field management, especially in the rural support programs, social mobilization. Development issues, including the community development, empowerment of the grass-root development.

PERSONNEL

- Father's Name : Rasool Bux Brohi
- Date of Birth : 17.05. 1981
- Domicile & PRC : Thatta Rural
- NIC Card : 41409-1302130-7
- Marital Status : Married
- Qualification : M.A (P/Science) (University of Sindh Jamshoro)
  B.A (University of Sindh Jamshoro)
  M.Ed (University of Sindh Jamshoro)
  B.Ed (University of Sindh Jamshoro)
  Intermediate: B.I.S.E Hyderabad

Markaz Coordinator in National Commission for Human Development (NCHD) Thatta from January 2010 till today.

Key Responsibilities Include:

- Ensure Participation of 100% teachers in UC Level Workshops

- Facilitate SPEs/RP/LCs to conduct UC level Teachers Training for BLS and Enrolment
- Facilitate SPEs/RP/LCs to prepare Work Plans to monitor BLS and Enrolment activities
- Joint Visits along with SPEs/RP/LCs to Monitor activities of teachers
- Facilitate Teachers to hold community meetings, identification of volunteers, BLS, preparation of UPE register, Enrolment and Reporting during regular field visits
- Facilitate teachers for regular community coordination to prevent drop out at village level and preparation and submission of monthly Ghoshwara
- Identify training need for teachers and prepare plan along with SPEs/RP/LCs to provide training to teachers
- Facilitate to SPEs/RP/LCs to obtain reports from teachers and then compilation of submitted reports for timely submission to DOEs and ensure timely feedback to teachers
- Validation of 5% data on prescribed format in all villages of assigning area
- Facilitate to SPEs for 5% validation of all villages in all assigned UCs
- After enrolment, Visit Schools – 33% in one month, preferably along with the supervisory staff of the Education Department
- Carry out student assessment on learning achievement of all the students in grade Katchi, Obtain reports, Ghoshwara from DPM-E and verify through MCs prepare validation reports
- ***Monitoring Officer*** in National Commission for Human Development (NCHD) Thatta from March 2009 to Jan 2010.

Key Responsibilities Include:

- Ensure Participation of 100% teachers in UC Level Workshops
- Facilitate SPEs/RP/LCs to conduct UC level Teachers Training for BLS and Enrolment
- Facilitate SPEs/RP/LCs to prepare Work Plans to monitor BLS and Enrolment activities
- Joint Visits along with SPEs/RP/LCs to Monitor activities of teachers
- Facilitate Teachers to hold community meetings, identification of volunteers, BLS, preparation of UPE register, Enrolment and Reporting during regular field visits

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- Validation of 5% data on prescribed format in all villages of assigning area
- Facilitate to SPEs for 5% validation of all villages in all assigned UCs
- After enrolment, Visit Schools – 33% in one month, preferably along with the supervisory staff of the Education Department
- Carry out student assessment on learning achievement of all the students in grade Katchi, Obtain reports, Ghoshwara from DPM-E and verify through MCs prepare validation reports

Markaz Coordinator in National Commission for Human Development (NCHD) Mirpur Khas from 2006 to 2008.

Key Responsibilities Include:

- Ensure Participation of 100% teachers in UC Level Workshops
- Facilitate SPEs/RP/LCs to conduct UC level Teachers Training for BLS and Enrolment
- Facilitate SPEs/RP/LCs to prepare Work Plans to monitor BLS and Enrolment activities
- Joint Visits along with SPEs/RP/LCs to Monitor activities of teachers
- Facilitate Teachers to hold community meetings, identification of volunteers, BLS, preparation of UPE register, Enrolment and Reporting during regular field visits
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- Identify training need for teachers and prepare plan along with SPEs/RP/LCs to provide training to teachers
- Facilitate to SPEs/RP/LCs to obtain reports from teachers and then compilation of submitted reports for timely submission to DOEs and ensure timely feedback to teachers
- Validation of 5% data on prescribed format in all villages of assigning area

- Facilitate to SPEs for 5% validation of all villages in all assigned UCs
- After enrolment, Visit Schools – 33% in one month, preferably along with the supervisory staff of the Education Department
- Carry out student assessment on learning achievement of all the students in grade Katchi, Obtain reports, Ghoshwara from DPM-E and verify through MCs prepare validation reports

Social Organizer in National Commission for Human Development (NCHD) Universal Primary Education Project Taluka Thatta from 2004 to 2006

Key Responsibilities:

- Data collection of area.
- Analysis on Base line survey
- Community Mobilization
- To provide the trainings to the local community members
- Capacity buildup of volunteers
- Reporting to ADPME
- Formation of Community Organizations
- Capacity Building/Skill Enhancement of rural masses
- Rural Development through participation
- Creation of awareness for Natural Resource Management
- Capital Formation
- Facility through Social Mobilization
- Data collection of area.
- Analysis on Base line survey
- Mass awareness
- To provide the trainings to the local community members

Responsibilities:

- Data Collection
- SMC Meetings
- Need Assessment
- Community Mobilization
- Volunteer's identification

- Capacity Building of Teachers/Community
- House Hold Survey
- List out. Out of Children
- Ensure 100% Enrollment through volunteers, parents & teachers.
- Arrange Enrollment walks.
- Record maintaining.

Training Area:

- Social Mobilization
- Quality Education
- Capacity Building
- Communications
- Volunteer's identification.

TRAININGS

- 4 Days Training on Social Mobilization by NCHD at Thatta.
- 4 Days Training workshops on Base line survey (House Hold) by NCHD at Thatta.
- 2 Days Training workshop on Community Mobilization by NCHD at Thatta.
- 2 Days Training for Master Trainer on Enrollment & Drop out at Thatta by NCHD.
- 2 Days Training workshop on Master Trainer on Quality Education at Thatta by NCHD.
- 7 Training workshop on the topic of “Village Volunteers” (2006) as a facilitator by Takhleeq Foundation.
- 1 day training of PDMA Survey of flood affectees.
- 3 days Training on establishment of Temporary Learning Centers.

SKILLS

- Group Formation at Community level
- Writing Training Programs / Workshops materials in Sindhi and Urdu
- Networking
- Documentation

- Research and Survey
- Writing & Compiling Activity Reports
- Conducting and Facilitating Workshops, Seminars, Theaters and Meetings.
- Coordination with Print Media Electronic Media

COMPUTER SKILLS

- MS Office
- Internet

LANGUAGES (Written & Spoken)

- English (Writing)
- Urdu
- Sindhi

HOBBIES

- Writing
- Reading
- Cricket
- Music

REFERENCE

Mr. Fahim Abbasi

Schools Activity Manager for the Pakistan

Safe Drinking Water & Hygiene Promotion Project

Academy for Educational Development (AED)

Islamabad

Office Karachi

E-mail:

Cell: 0300-2104448, Office: 0215822373

Mr. Ghulam Rasool Khatri

Site Manager,

WWF-Ketibandar

Cell: 0333-2983966

Mr. Mahfooz Ahmed Bhatti

Chief Accountant, Pakistan Railway Karachi,

EX General Manager

National Commission for Human Development (NCHD)

HDSU-District Thatta

Cell: 0300-2188091

Annexure H

Terms of Partnership with KYWDO and Photographs of I.T Center

ZORLU ENER

March 05, 2012

Mr. Abdul Razzaq Barch
President
Keenjher Youth Welfare Development Organization (KYWDO)
Jhimpir

Dear Mr. Barch,

TERMS OF PARTNERSHIP

This is reference to the recommendation of WWF Pakistan / Indus for All Programme to provide financial aid to your program that you are operating under the name and style of **Keenjhar Youth Computer Center** for providing basis computer literacy to the youth of Jhimper town and surrounding.

We appreciate this cause and welcome the WWF Pakistan recommendation, and pleased to inform you that our management has agreed to sponsor your computer center initially for a period of one year from March 2012 to February 2013.

We will pay through banking channel in favour of the **Keenjhar Youth Welfare Development Organization** having bank account **# 731-5 National Bank Pakistan Jhimper Branch Code # 0252** to **PKR 30,000/-** each month, subject to withholding of income tax under the provisions of Income Tax Ordinance, 2001.

The financial assistance is subject to performance that may be evaluations as follows:

1. KYWDO will establish and maintain admission criteria – a copy of such document shall be provided to Zorlu and WWF Pakistan.
2. KYWDO will maintain attendance of instructors and students – a summarized report shall be provided to Zorlu and WWF Pakistan on monthly basis.
3. KYWDO will also maintain record of expenditures and assets, with monthly reporting to Zorlu and WWF Pakistan
4. KYWDO shall report on monthly basis to ZEPL and WWF Pakistan in summarize manner, or as required by Zorlu and WWF Pakistan from time to time.
5. KYWDO assures to listen, Zorlu and WWF Pakistan suggestions for improvement.
6. Zorlu and WWF-Pakistan may undertake scheduled visit at the computer center.
7. Zorlu Enerji Pakistan may withdraw financial support and WWF-Pakistan, Indus for All Programme will have an authority to take all provided equipment's and furniture, if cause under discussion in not functional or active.

Good luck.

For: Zorlu Enerji Pakistan Limited

Syed Mumtaz Hassan
Country Manager

Accepted by: Mr. Abdul Razzaq Barch
President
KYWDO Jhimper

PRESIDENT
Keenjhar Youth Organization
Jhimpir, Thatta.

CC: Ghulam Rasool Khatri,
Manager, Programme Implementation Unit (PIU) Keenjhar Lake,
Indus For All Programme (IFAP), WWF – Pakistan
Tel: 0298-624571 Cell: 0333-2983966

ZORLU | ZORLU ENERJI PAKISTAN LIMITED
Head Office : C-117, Clifton Block 2, Karachi, Pakistan. Tel: +92 (21) 35291 [illegible]

Keenjhar Youth Computer Center Photographs

Annexure I

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

Full Name	Mr / Ms.	Department	Duty Place	Gross Salary
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

Ghulam Umar	**Mr.**	**Operations**	**SO**	**23,760**
Shahnawaz	**Mr.**	**Operations**	**SO**	**17,820**
Full Name	**Mr / Ms.**	**Department**	**Duty Place**	**Gross Salary**
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 J

Solid Waste Generated at Zorlu Wind Farm

Sr. No.	Area	Sources	Types of Waste	Waste Generated (kg/day) for O & M Phase	
1	Construction Camp	Kitchen	• Food waste • Polythene bags • Broken glass • Empty water bottles		15-20
		First Aid Room	• Paper waste • Medicines • Polythene bags • Bandages • Packaging material • Sharps • Empty water bottles		0.2-0.3
		Offices	• Paper waste • Card board		0.5-1
		Stores	• Packaging material • Plastic Containers • Metal Containers • Metal Scrap		1-2
		Mechanical Workshops	• Broken parts • Grease and other lubricants • Oily rags • Empty oil and lubricant containers • Metal scrap		0.5-1
		Residential Area	• Papers • Polythene bags; • Wrappers (empty cardboard boxes and containers for edible items. • Broken pieces of Glass • Empty water bottles • Rubbish		5-10
2	Batching Plant	Plant	• Waste batching material including cement and gravel etc. • Metal scrap • Empty metal and plastic containers • Empty fuel containers		Nill
		Work force	• Papers		0.5-1.5

Sr. No.	Area	Sources	Types of Waste	Waste Generated (kg/day) for O & M Phase	
			• Polythene bags; • Wrappers (empty cardboard boxes and containers for edible items. • Empty water bottles		
3	Grid Station and O & M control building	O & M activities	• Metal and plastic Scrap material • Construction waste (sand, cement, gravel, stones and bricks etc.) • Empty fuel containers		negligible
		Workers	• Papers • Polythene bags; • Wrappers (empty cardboard boxes and containers for edible items. • Empty water bottles		1-2
Total Waste Generated (kg/day)					23.7-37.8

Segregation of Waste

Solid waste is segregated by following rule of 3R's i.e. reduce, reuse and recycling, while solid waste which could not be reused or recycled is finally disposed of in the landfill site.

Reusable Material

- Plastic Containers
- Metal Containers
- Empty Water Bottles

Reusable items are used within the Zorlu Wind Farm as and when required, otherwise stored at designated sites located within the construction camp.

Recyclable Material

- Empty Water bottles
- Polythene bags
- Paper waste
- Metal and plastic scrap
- Packaging material

All these recyclable items are sold to local recycling companies at Karachi at intervals depending upon the quantity of recyclable able material generated.

Disposable Material

- Food waste
- Broken glass
- Medicines
- Bandages
- Sharps
- Rubbish
- Construction waste (sand, cement, etc.)

Solid waste components which could not be reused or recycled are finally disposed of in the landfill site constructed for this purpose.

Bio-medicinal waste, although it is of negligible amount, is disposed off separately at waste disposal sites.

Annexure K

Bird Monitoring Process/Methodology, and Findings of Bird Monitoring

Bird Monitoring Methodology

Introduction

By: Zahid Baig Mirza

Bird monitoring assignment was taken up as it was required in the environment impact assessment because of the location of this wind energy farm close to (about 5km) Keenjhar Lake Wildlife Sanctuary where migratory waterfowl overwinter and many local birds also breed in the area. Additionally the 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 the wind turbines and power lines. Other information needed was the impact of disturbance on bird diversity, density and behavior during the construction work and afterwards from the running activities of the WEF. More over since the 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 the 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 the flocks of water birds and other Passerine birds that just fly pass over the 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 the 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 only five Km. distance from Keenjhar Lake.

It is well known that the birds of prey while swoop-diving for their prey, gain tremendous speed. There is great risk of collusion of these birds with the rotating blades of the wind turbines. However, there was no information about such diurnal predators which daily soar or hover or cross over the area.

There was no data on the density and diversity of bird species of the study area for comparison with post construction period data to judge the impact of the project on the birds.

It is known that that the fruit bats do collide with low-tension power lines along the roads or in urban areas. But that is more of electrocution rather than mere collusion, because fruit bats have good nocturnal vision. However, Jhimpir wind energy farm is not the area where fruit bats occur.

Nocturnal small bats have very poor visibility, so they are adapted to navigate with the use of echolocation. They are not likely to collide with the blades of wind turbines.

Thatta district's lakes are wintering grounds for water fowl. These lakes are also staging ground for birds migrating further south or back. There was no data of the density of migratory water fowl that pass over the Jhimpir wind energy farm.

Bird 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 a first step the author of this document visited the project area on 16th February, 2012 to observe the transmission lines, transmission towers, fences of enclosures, new buildings of the offices with some newly planted trees and the high towers of the 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 the noise intensity range from the turbines into the zero noise area (control area up to half a kilometer). The bird observations were made after the sunrise in the morning and about one hour before sunset each day punctually and regularly. Birds were watched 25m on the left and right sides, as well as in front and overhead while moving at a slow/medium pace in the 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.

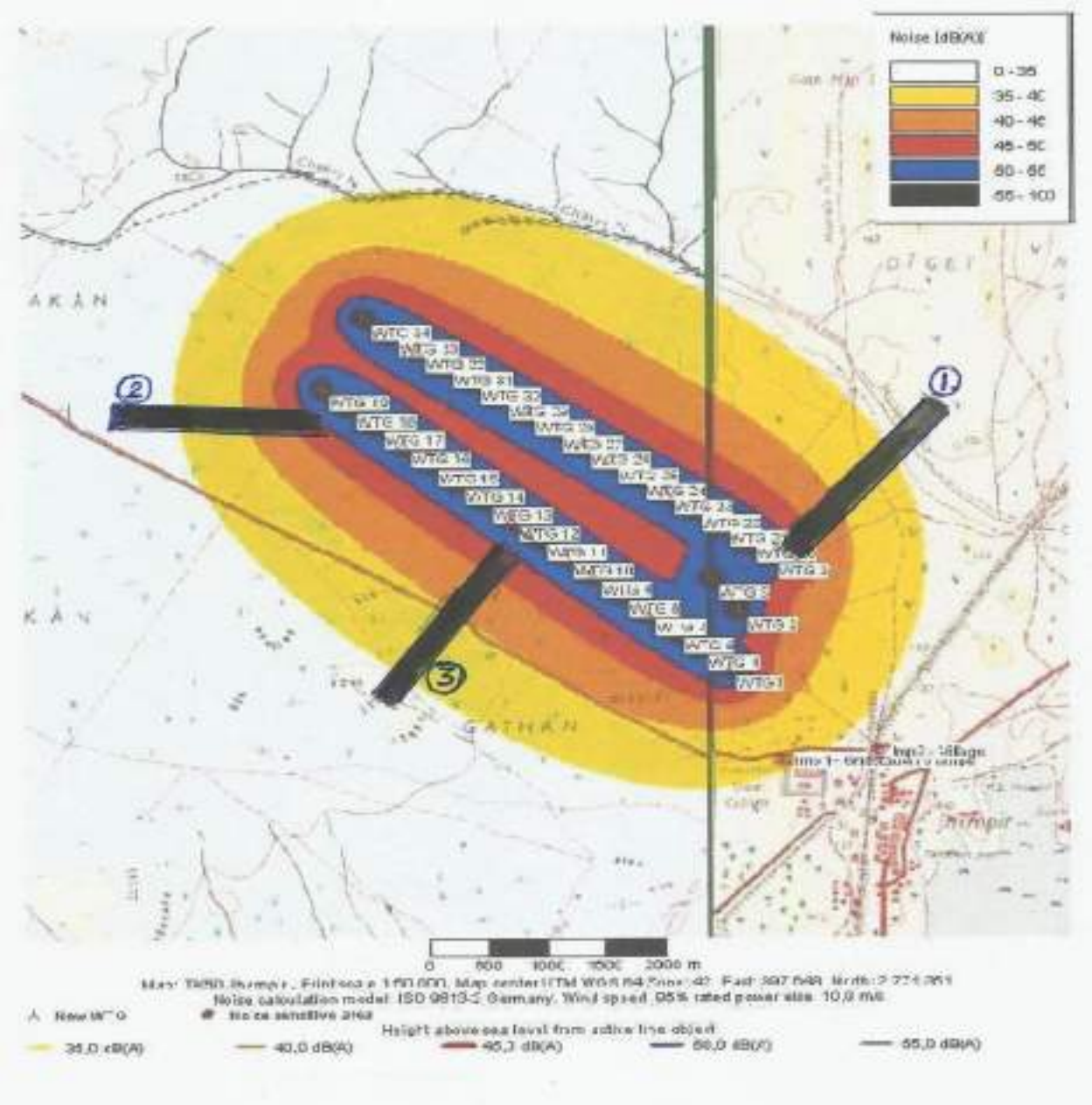
6. Air temperature:

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 the Reporting Period

- There was no incidence of bird collusion with the 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 the bird migration season flocks birds were sighted quite high (above 500 ft. or more) over the 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 of the birds of the area. This checklist indicates that there is no threatened species of the birds occurring in the area, and 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 or alarming information that may be highlighted in this brief.

SYSTEMETIC CLASSIFICATION OF THE BIRDS OBSERVED AT ZWEF, JHIMPIR THATTA

AND THEIR IUCN STATUS

SYSTEMETIC CLASSIFICATION AND DISTRIBUTION	IUCN STATUS	Conservation status
Kingdom: Animalia		
Phylum: Chordata		
CLASS: AVIES		
ORDER: PELECANIFORMES **FAMILY: PHALACROCORACIDAE**		
Great or Eurasian Cormorant *Phalacrocorax carbo* **Distribution**: Winter visitor to inland water bodies and coastal waters; on transit migration along Indus and Kabul rivers in northern Pakistan. Some year round residents in Sindh and southern Balochistan.	Least concern	Common
ORDER: CICONIFORMES **FAMILY: ARDEIDAE**		
Black Bittern or Yellow throated Bittern *Ixobrychus flavicollis* **Distribution:** Resident in lower Sindh in thick marginal growth of lakes and marshes; breeds along main rivers of Punjab and Sindh in thick marginal vegetation of ponds and marshes.	Least concern	Common
Night Heron *Nycticorax nycticorax* **Distribution:** Resident in suitable pond areas in NWFP, Punjab and Sindh; breeds in tall vegetation of wetlands and nearby trees. Disperses widely in summer, wandering to Gilgit. It occasionally passes over Deosai Plateau. It is also irregular visitor to Balochistan.	Least concern	Common
Little Green Heron or Green-backed Heron *Butorides striatus* **Distribution:** Resident in ponds, lakes and marshes with tall thick marginal vegetation, in Sindh. Irregular year round visitor to similar areas of Punjab.	Least concern	Common
Indian Pond Heron or Paddy bird *Ardeola grayii* **Distribution:** Resident in ponds, lakes and marshes.	Least concern	Common
Cattle Egret *Bubulcus ibis* **Distribution:** Resident in irrigated areas of plains and lower hills, lakes, ponds and rivers; absent from Balochistan.	Least concern	Common
Intermediate Egret *Egretta intermedia* **Distribution:** Irregular year round visitor to wetlands of the plains; resident mainly of estuaries	Least concern	Common

Large Egret*Egretta alba* **Distribution:** Resident in lakes of Salt Range, barrage areas of main rivers, delta and estuaries; wintering in wetlands of plains, also in northern Balochistan.	Least concern	Rare
FAMILY: THRSKIORNITHIDAE		
Glossy Ibis *Plegadis falcinellus* **Distribution:** Resident populations in Sindh, which also sporadically visit pond areas upstream of Indus and other rivers in Punjab. Passage migrant in Balochistan and Punjab.	Least concern	Common
ORDER: PHOENICOPTERIFORMES **FAMILY: PHOENICOPTERIDAE**		
Greater Flamingo *Phoenicopterus ruber* **Distribution:** Winter visitor to coastal areas, and irregular winter visitor to large size inland water bodies. Breeds in Rann of Kutch.	Least concern	Common
ORDER: ACCIPITRIFORMES **FAMILY: ACCIPITRIDAE**		
Short-toed Eagle *Circaetus gallicus* **Distribution:** Resident of Margallah hills range, Kahuta, Salt range, Lal Sohanra National Park, mountains of Balochistan and Indus delta: irregular year round visitor to western mountains, Potohar plateau, Cholistan and Thar.	Least concern	Common
Pallid Harrier *Circus macrourus* **Distribution:** Winter in KPk, Punjab and Sindh, also the mountainous north on passage migration.	Near threatened	Rare
Montagu's Harrier *Circus pygargus* **Dstribution:** Winters in KPk, Punjab and Sindh.	Least concern	Common
Desert Buzzard *Buteo buteo* **Distribution:** Winter visitor to open areas in Pakistan including Gilgit, where it is ncommon. In summer recorded in deosai plains.	Least concern	Common
Long-legged Buzzard *Buteo rufinis* **Distribution:** Widespread winter visitor: breeds in summer in Northern mountains, and also in Salt range in small numbers. Also recorded in Deosai plains in summer.	Least concern	Common
Greater Spotted Eagle *Aquila clanga* **Distribution:** Winter visitor to Indus plains; occasional summer	Vulnerable	Rare

breeder in scattered areas in Sindh.		
ORDER: FALCONIFORMES **FAMILY: FALCONIDAE**		
Peregrine or Shaheen Falcon *Falco peregrines* Winter records for all provinces, usually in plains(now extremely rare)	Least Concern	Rare. Restricted catching allowed
ORDER: GALLIFORMES **FAMILY: PHASIANIDAE**		
See-see Partridge *Ammoperdix griseogularis* **Distribution:** Salt range, Kala Chitta range and western mountains, including coastal ranges of Balochistan.	Least concern	Common Restricted hunting allowed
Grey Partridge *Francolinus pondicerianus* **Distribution:** Drier and open areas of low hills and plains of NWFP, Punjab, Sindh and southern Balochistan.	Least concern	Common Restricted hunting allowed
Black-breasted Quail or Rain Quail *Coturnix coromandelica* **Distribution:** Arrives from India in late June to crops and grassland in upper Punjab and lower Sindh. Some birds are resident in southern Sindh, Breeds in August and September, and migrates eastward into India by October.	Least concern	Common Restricted hunting allowed
ORDER: GRUIFORMES **FAMILY: RALLIDAE**		
Ballion's Crake *Porzana pusilla* **Distribution:** Winter visitor to wetlands of Punjab, Sindh and some wetlands, if not dry, in northern Balochistan. On passage through Kohat, Gilgit and Deosai in Baltistan.	Least concern	Uncommon
FAMILY: GRUIDAE		
Houbara *Chlamydotis undulate* **Distribution:** Reduced breeding population in Nag, some valleys near Besima and hills in Chagai district. Major influx of wintering population to open areas in Punjab, Sindh and Balochistan. On passage also in KPk.	Vulnerable	Uncommon hunting allowed under special permit
ORDER: CHARADRIIFORMES **FAMILY: RECURVIROSTRIDAE**		

Black-winged Stilt *Himantopus himantopus* **Distribution:** Resident of shallow water sheets, breeding from central Punjab to south Sindh and Balochistan coastal areas. During non-breeding season disperses further north to available water sheets plains. However, small flocks (16) in summer in Deosai plateau.	Least concern	Common game bird
FAMILY: BURHINIDAE		
Stone Curlew *Burhinus oedicnemus* **Distribution:** rare, resident of scrub deserts and sand dune deserts, recorded from areas of Khyber pass and Kohat in NWFP, Punjab, Sindh and Balochistan; author had seen it on Makhad road side stony land in Attok district.	Least concern	Uncommon game bird
FAMILY: CHARADRIDAE		
Little Ringed Plover *Charadrius dubius* **Distribution:** Breeds on dry beds of rivers in plains, joined by wintering populations from north, disperses to available water sheets in all provinces in plains.	Least concern	Common game bird
Common Ringed Plover *Charadrius hiaticula* **Distribution:** Winter visitor to coast and estuaries near by Karachi and Human-e Mashkhel, Balochistan.	Least concern	Common game bird
Kentish Plover *Charadrius alexandrius* **Distribution:** Breeds mainly in southern coast and Runn of Kutch, Nara, Rahim Yar Khan, Lahore, Rasul Head Works river islands (observed by author), and also recorded from Band Khush Dil Khan in Balochistan. Wintering in wetlands of Punjab, Sindh and western Balochistan. Passage migrant in Gilgit Chitral and Kohat.	Least concern	Common game bird
Greater Golden Plover *Pluvialis apricaria* **Distribution:** Rare winter visitor to lakes in Sindh and coastal waters; large concentrations in end winter at Hamun-e-Mashkhel and small number in winter at Hamun-a-lora in Balochistan.	Least concern	Common game bird
Yellow-wattled Lapwing *Hoplopterus malabaricus* **Distribution:** Summer breeding visitor to suitable nesting areas in and around Karachi, creeks and delta and some lakes in lower Sindh. (the author saw a pair near Badin).	Least concern	Common game bird
FAMILY: SCHLOPACIDAE **Sub-Family: CALIDRIDINAE**		
Sharp-tailed Sandpiper *Calidris acuminate* **Distribution:** Recorded from Gilgit, Deosai plains and Kharrar lake Renala Khurd, Punjab and Thatta, Sindh.	Least concern	Common game bird
Curlew Sandpiper or **Curlew Stint** *Calidris ferruginea* **Distribution:** Winter visitor to the coast; passage migrant along the	Least concern	Common game bird

Indus through extreme northern Pakistan; summer record from Deosai plains.		
Ruff (& Reeve) *Philomachus pugnax* **Distribution:** Some wintering in Sindh, however, abundant influx on double passage through migrants in Northern Areas, KPk, Punjab, Balochistan and Sindh. Author has seen huge flocks in Hamun-e-Mashkhel in early March.	Least concern	Common game bird
Sub-Family: TRIGINAE		
Terek Sandpiper *Xenus cinereus* **Distribution:** Winter visitor to sea coast; Some passage migrants in Punjab, Sindh and Balochistan.	Least concern	Common game bird
FAMILY: LARIDAE		
Saunder's Little Tern *Sterna saundersi* **Distribution:** Tidal creeks, coastal lagoons, open sea in breeding season and summer; breed along the coast at suitable places.	Least concern	Common
White-Winged Black Tern *Childonias leucopterus* **Distribution:** Fresh water Tern; regular spring migrant recorded on lakes of Sindh. Summer record from Deosai plateau.	Least concern	Common
ORDER: PTEROCLIDIFORMES **FAMILY: PTEROCLIDIDAE**		
Painted Sandgrouse *Pterocles indicus* **Distribution:** Resident of some stony areas around hill in Salt range and Kohat. In winter disperses in Punjab and Sinh plains.	Least concern	Common game bird
Close-barred Sandgrouse *Pterocles lichtensteinii* **Distribution:** Rocky areas of south western Balochistan, close to Karachi northward, and Khirthar National Park.	Least concern	Common game bird
Coronetted Sandgrouse *Pterocles coronatus* **Distribution:** Mainly in western and southern Balochistan, also in southern Sindh.	Least concern	Common game bird
Spotted Sandgrouse *Pterocles senegallus* **Distribution:** Winter visitor to Thal, cholistan and Thar sandy deserts; barren flats of Sibi; stony barren lands at the foot-hills west of Indus, at the base of Mekran foot-hills; breeding records in southern Balochistan and stony barren lands in Chagai. Passage migrant in western and central Balochistan.	Least concern	Common game bird
Chestnut-bellied Sandgrouse *Pterocles exustus*	Least concern	Common game

Distribution: Resident of stony barrens of Salt range, the western foot-hills and southern Balochistan; also common in sandy deserts of Thal, Cholistan and Thar.		bird
ORDER: COLUMBIFORMES **FAMILY: COLUMBIDIDAE**	Least concern	
Blue Rock Pigeon *Columba livia* **Distribution:** All over Pakistan, including Deosai plains; very rare or absent from eastern parts of the deserts of Cholistan and Thar, and also eastern hill regions of Rawalpindi and Hazara.	Least concern	Common game bird
Eastern Stock Pigeon *Columba eversmanni* **Distribution:** Winter visitor to agricultural areas in plains of Punjab and Sindh, night roosting on tall trees, usually along large canals and near barrages. The author has collected specimens near Lahore.	Least concern	Common game bird
Indian Ring Dove *Streptopelia decaocto* **Distribution:** Resident of Indus plains; disperses to broader valleys in KPk and Balochistan in summer and breeds.	Least concern	Common game bird
Red Turtle Dove *Streptopelia tranquebarica* **Distribution:** Summer visitor, March to September, in wooded plains of Punjab, Sindh and some lower valleys of KPk. In lower Sindh few birds may over winter in well wooded habitats.	Least concern	Common game bird
Little Brown Dove *Streptopelia senegalensis* **Distribution:** Resident of Indus plains and southern Balochistan; in summer disperses to and breeds in western mountainous region, Balochistan, in Indus valley up to the start of Northern Areas and in the desert of Cholistan.	Least concern	Common game bird
ORDER: PSITTACIFORMES **FAMILY: PSITTACIDIDAE**		
Rose-ringed Parakeet *Psittacula krameri* **Distribution:** Resident of plains of all provinces including foothill in Punjab and KPk up to 3,000 ft. elevation. In Balochistan it is seen in Quetta in summer. In Skardu a feral population of some released cage-birds survives even through severe winters.	Least concern	Common
ORDER: CUCULIFORMES **FAMILY: CUCULIDIDAE**		
Pied Crested Cuckoo *Clamator jacobinus* **Distribution:** Summer breeder in Sindh and Punjab, arriving before monsoons; start arriving in Lahore by early April and in Islamabad it was seen by the author on 4rth April, 2002; migrate south (perhaps to	Least concern	Common

east Africa or to south India) by the end of October or early November.		
Large Hawk Cuckoo *Hierococcyx sparverioides* **Distribution:** Recorded from Murree Hills; the author saw it near Dhirkot Govt. lodge Azad Kashmir, in August, 1998. A vagrant record from Jhimpir, Thatta, 2012.	Least concern	Uncommon
Koel *Euedynamys scolopaceus* **Distribution:** resident of extreme south western Sindh; and summer breeding visitor to trees in Sindh and Punjab, Islamabad, Peshawar and Kohat valley.	Least concern	Common
Greater Coucal or Common Crow-pheasant *Centropus sinensis* **Distribution:** Resident of Punjab, lower valleys of NWFP, Sindh and Sibi plains in Balochistan, in grassy or reed growth in and near the ponds and Jheels, canals and agricultural areas close to water bodies.	Least concern	Common
ORDER: STRIGIFORMES **FAMILY: STRIGIDIDAE**		
Pakistan Scops Owl *Otus bakkamoena* **Distribution:** Wintering in plains of Punjab, Peshawar, Kohat; Sibi and Sindh including Nara. Summer range extends also to hilly areas in Murree hills, Hazara, Malakand division up to 7,000 ft. The author collected a specimen from Khanaspur, Ayubia, (Murree hills).	Least concern	Common
Spotted Owlet *Athene brama* **Distribution:** Resident of Indus plains, Kohat district, Peshawar, foothills of Balochistan, including around Quetta and Sibi area.	Least concern	Common
ORDER: CAPRIMULGIFORMES **FAMILY: CAPRIMULGIDAE**		
Little or Indian Nightjar *Caprimulgus asiaticus* **Distribution:** Resident of lower Sindh, and also in Dadu district.	Least concern	Common
Egyptian Nightjar *Caprimulgus aegyptius* **Distribution:** Extreme north western area of Balochistan in Chagai district. Vagrant to Thatta district.	Least concern	Common
ORDER: APODIFORMES **FAMILY: APODIDAE**		
Pale Brown Swift or Pallid swift *Apus pallidus* **Distribution:** Winter visitor along Mekran coast up to Karachi. Now	Least concern	Common

sighted at Jhimpir.		
ORDER: CORACIIFORMES **FAMILY: MEROPIDAE**		
Little Green Bee-eater *Merops orientalis* **Distribution:** Wide spread in Punjab and Sindh; Extends its range extends westward during summer breeding, to Swat, along western mountains, Sibi plains, along the mountains of central and southern Balochistan and Mekran coast.	Least concern	Common
FAMILY: CORACIIDAE		
Indian Roller *Coracias benghalensis* **Distribution:** Resident of the plains of NWEP, Punjab, Sindh, Sibi and Mekran coast; during summer breeding range is extended to northern and western mountains; the coastal population range is also broadens.	Least concern	Common
FAMILY: UPUPIDAE		
Hoopoe *Upupa epops* **Distribution:** Resident of Punjab, plains of NWFP; wintering population in lower Punjab and Sindh, including thorn forests of Thar (observed by the author). During summer it breeds in northern and western mountains, including western Balochistan.	Least concern	Common
ORDER: PASSERIFORMES **FAMILY: ALAUDIDAE**		
Singing Bush Lark *Mirafra cantillans* **Distribution:** Salt range and southern Sindh.	Least concern	Common
Red-winged Bush Lark *Mirafra erythroptera* **Distribution:** Salt range and southern Sindh and Lasbela in Balochistan.	Least concern	Common
Ashy crowned Finch Lark *Eremopterix grisea* **Distribution:** Indus plains except eastern and southern sandy desert belt; Kohat, and open areas west of Hub river in southern Balochistan.	Least concern	Common
Black crowned Finch Lark *Eremopterix nigriceps* **Distribution:** Recorded from salt range, central Punjab; Sindh in Nara Area and areas along Indus south to coast and westward up to mid	Least concern	Common

Mekran coast; breeding recorded at suitable areas within the range.		
Slender Billed Lark or Hume's Short-toed Lark *Clandrella acutirostris* **Distribution:**Winter visitor in whole of Balochistan and Sindh Kohistan; passage migrant over western mountains up to Chitral.	Least concern	Common
Indus Sand Lark *Clandrella raytal* **Distribution:** Resident of sandy islands of river beds in Punjab and Sindh, coastal sand dunes, margins of larger lakes, including the Ladamsar reservoir in Lal Suhanra National Park, and Nara canal area in Sindh.	Least concern	Common
Crested Lark *Galerida cristata* **Distribution:** Throughout Pakistan, except high mountains and valleys, cholistan and Thar desert and southern Sindh.	Least concern	Common
Small Skylark *Alauda gulgula* **Distribution:** Summer breeder in Northern and western Pakistan, except extreme western and south western Balochistan; year round resident of eastern and southern Pakistan, except Cholistan and Thar deserts.	Least concern	Common
FAMILY: HIRUNDINIDAE		
Indian Sand Martin *Riparia paludicola* **Distribution:** Indus plains from KPk to Sindh and in Balochistan in Hingol and Hub river valleys near the coast.	Least concern	Common
Collard Sand Martin *Riparia riparia* **Distribution:** Breeds in summer in Chitral, Swat, Kohistan, upper Kaghan and Neelam valleys, Potohar and Salt range; probably in western mountains; it breeds around Quetta and Pashin and Noshki and Zangi Nawar. Winters in Indus plains of NWFP, Punjab and Sindh; Sibi plains and some mountainous areas of Kalat.	Least concern	Common
FAMILY: MOTACILLIDAE		
Tawny Pipit *Anthus campestris* **Distribution:** Wintering in Gilgit in lesser number but common in plains, from KPk and Potohar south to southern Sindh and Makran coastal areas, also Sibi plains, avoiding sandy desert.	Least concern	Common
Tree Pipit *Anthus trivialis* **Distribution:** Breeds in Gilgit, upper Kaghan, upper Neelam; Mankial range, Swat Kohistan from 9,000 ft. to 14,000 ft. On double passage migration in Chital, Swat, Hazara, Potohar, Indus plains in Punjab and along Indus south to delta.	Least concern	Common
Water Pipit *Anthus spinoletta*	Least concern	Common

Distribution: Wintering from Gilgit, Swat to water areas in KPk, Punjab, Sindh and Balochistan.		
Siberian Pied Wagtail *Motacilla alba dukhunensis* **Distribution:** Winter visitor to non desert areas of Pakistan, but mainly to Indus plains, including Potohar and Salt range. Common double passage visitor to KPk, Chitral, Gilgit, Kohat.	Least concern	Common
FAMILY: PYCNONOTIDAE		
White-cheeked Bulbul *Pycnonotus leucogenys* **Distribution:** Usually found up to 7,000 ft. in Chitral, Dir, Swat, Hazara , Azad Kashmir; Murree hills, Kahuta hills, Potohar, Salt range western mountains, Balochistan except western the part, and Indus plains.	Least concern	Common
Red-vented Bulbul *Pycnonotus cafer* **Distribution:** Agricultural areas in the plains of KPk, Potohar, Punjab, Sibi plains and Sindh, including urban green areas.	Least concern	Common
FAMILY: BOMBYCILLIDAE **SUB-FAMILY: BOMBYCILLINAE**		
Waxwing *Bombycilla garrulous*	Least concern	Common
FAMILY: TURDIDAE **SUB-FAMILY: TURDINAE**		
Brown Rock-chat *Cercomela fusca*	Least concern	Common
White-tailed Bush-chat *Saxico laleucura*	Least concern	Common
White-tailed Bush-chat *Saxicola leucura*	Least concern	Common
Red-tailed Wheatear *Oenanthe xanthoprymna*	Least concern	Common
Indian Robin *Saxicoloides fulicata*	Least concern	Common

Dark-throated Thrush or Black-throated Thrush *Turdus ruficollis atrogularis* **Distribution:** Western mountains from west of Kohat to Quetta; occasional visitor to Banu and also as far south as Karachi and Thatta.	Least concern	Common
FAMILY: SYLVIDAE		
Moustached Sedge Warbler *Acrocephalus melanopogon* **Distribution:** Winter visitor to reed growth on the margins of water bodies in plains of KPk from Krurram valley, and Islamabad to southern Sindh including lakes of Nara, and in Balochistan in Zangi Nawar.	Least concern	Common
Desert Warbler *Sylvia nana* **Distribution:** Winters in plains of KPk; Punjab, including Potohar and Salt range and deserts of Thal and Cholistan; Balochistan in Sibi, and western deserts; and deserts of Sindh.	Least concern	Common
FAMILY: MUSCICAPIDAE		
Red-breasted Flycatcher *Ficedula parva* **Distribution:** Double passage migrant in most of NWFP, Punjab, eastern mountainous Balochistan including Sibi plain and Sindh, almost along Indus and areas in its west, up to coast.	Least concern	Rare winter visitor
Kashmir Red-breasted Flycatcher *Ficedula subrubra* **Distribution:** In spring records in Chitral and Haleji lake in southern Sindh; breeding record in Drosh and Neelam valley.	Least concern	Rare winter visitor
Grey-headed Flycatcher *Culicicapa ceylonensis* **Distribution:** In summer from Kaghan valley and Neelam valley to hills of Jhelum valley, Murree hills and Kahuta range from 4,000 to 9,000 ft. In winter Potohar, eastern Punjab and Sindh along Indus to coast.	Least concern	Rare winter visitor
FAMILY: RHIPIDURIDAE		
White-browed Fantail Flycatcher *Rhipidura aureola* **Distribution:** Resident of Indus plains in Punjab and Sindh, also in tree grove areas of Rawalpindi and Islamabad, Potohar and Salt range. Likes orchards, tree groves and canal side plantations.	Least concern	Common
FAMILY: TIMALIIDAE		

Sindh babbler *Chrysomma altirostre* **Distribution:** Along Indus from southern Punjab to southern Sindh also in Nara area in reeds.	Least concern	Common
Jungle Babbler *Turdoides striatus* **Distribution:** Common in gardens and plantations in whole of Indus plains from NWFP and Potohar to south Sindh, avoiding desert habitats.	Least concern	Common
FAMILY: NECTARIIDAE		
Purple Sunbird *Nectarinia asiatica* Resident from southern Punjab to south Sindh. Summer breeding in Punjab up to valleys of Margallah and in KPk in plains of Mardan, Peshwar and Kurram valley.	Least concern	Common
FAMILY: LANIIDAE		
Great Grey Shrike *Lanius excubitor* **Distribution:** Resident of Northern mountains in open slopes; eastern part of Punjab south of Salt range, in the scrub and low trees belt along Indus in Sindh; In the breeding season it can be seen in almost whole of Pakistan where ever low trees and bushes are available.	Least concern	Common
FAMILY: DICURURIDAE		
Black Drongo *Dicrurus macrocercus* **Distribution:** The author recorded it at 9,000 ft. in May in Kaghan valley; It is found in Jhelum valley, Neelam valley, northern mountains in Swat, Dir, Chitral, up to 8,000ft., Malakand, Hazara, Peshawar valley, Kohat, Potohar, Murree hills range, Murree foothills, southern Azad Kashmir, Potohar and Salt range, whole of irrigated Punjab, Sibi and Sindh.	Least concern	Common
FAMILY: CORVIDAE		
House Crow *Corvus splendens* **Distribution:** Plains of Pakistan including, Kurram valley, Potohar and Salt range.	Least concern	Common
FAMILY: STURNIDAE		
Common Myana *Acredotheres tristis* **Distribution:** NWFP, Punjab and Sibi, also southeastern end of	Least concern	Common

Balochistan in plains and outer Himalayan hills upto 8,000ft.		
Bank Myana *Acridotheres ginginianus* **Distribution:** Irrigated plains and riverine areas of NWFP, Punjab, and Sindh.	Least concern	Common
FAMILY: PASSERIDAE		
House Sparrow *Passer domesticus* **Distribution:** Resident of whole Pakistan, mainly human habitations and agricultural areas.	Least concern	Common
Sindh Jungle Sparrow *Passer pyrrhonotus* **Distribution:** Resident in Punjab and Sindh in tree areas and scrub, except Potohar, Salt range, Thal, Cholistan and Thar deserts. It is also found in Kabul river vale.	Least concern	Common

Annexure L

HSE Plan for O&M Phase

HEALTH AND SAFETY (HSE) PLAN FOR O&M

ZORLU O & M PAKISTAN JHIMPIR

PREPARED BY	CONTROLLED BY	APPROVED BY
JUNAID RAFIQUE	FATIH MEHMET NOHUT/ SHAHID ALI	/ OKTAY ERTUĞRUL / SECKIN DEMIR/ MUSHTAQ AHMED

DEFINITION OF TERMS

Accident

An unplanned or undesired event that can result in harm to people, property or the environment.

Exposure

The measurement of time during which the subject is at risk from a hazard.

Fatality

Death due to a work related incident or illness regardless of the time between injury or illness and death.

Harm

Includes death, injury, physical or mental ill health, damage to property, loss of Production, or any combination of these.

Hazard

A source or a situation with a potential to cause harm, including human injury or ill health, damage to property, damage to the environment, or a combination of these.

Housekeeping

Maintaining the working environment in a tidy manner.

HSE

Health, Safety and Environment.

Incident

An event that,
Results in death or injury to person where the injury requires medical attention (including first aid)
Results in injury/damage to persons, property or process, is not in compliance with statutory requirements, safe work procedures or in house guidelines.

Medical Treatment Case (MTC)

Work related injury or illness requiring more than first aid treatment by a physician, dentist, surgeon or registered medical personnel.

MSDS
Material Safety Data Sheet

Near Miss
A Near Miss is an event where no contact or exchange of energy occurred and thus did not result in personal injury, asset loss or damage to the environment.

Personal Protective Equipment (PPE)
All equipment and clothing intended to be utilized, which affords protection against one or more risks to health and safety. This includes protection against adverse weather conditions.

Restricted Work Case
Work related injury or illness that renders the injured person unable to perform all normally assigned work functions during a scheduled work shift or being assigned to another job on a temporary or permanent basis on the day following the injury.

Risk
A measure of the likelihood that the harm from a particular hazard will occur, taking into account the possible severity of the harm.

Risk Assessment
The process of analyzing the level of risk considering those in danger, and evaluating whether hazards are adequately controlled, taking into account any measures already in place.

Risk Management
The process of identifying hazards, assessing risk, taking action to eliminate or reduce risk, and monitoring and reviewing results.

Training
The process of imparting specific skills and understanding to undertake defined tasks.

Unsafe act or condition
Any act or condition that deviates from a generally recognized safe way or specified method of doing a job and increases the potential for an accident.

Communication
The flow of information between people.

Compliance
Ensuring that the requirements of laws, regulations, industry codes and organizational standards are met.

Conformance
Ensuring the requirements of the HSE Management System are met, including responsibilities to ensure health, safety and environmentally acceptable outcomes and to meet legal compliance requirements.

Contractor
Any individual or organization, including suppliers, contract staff and technical specialists, or any organization or person providing materials or services to the Zorlu O & M, who are not employees, and contribute to our service for a client. 'Contractor' also includes Entire staff in their capacity as service providers.

Emergency response plan
Describes how a specific emergency at a particular site will be combated. It includes specific information and detailed procedures or guidelines for responding to damaging events.

ISO 14001
International Standard Environment Management Systems – requirements with guidance for use.

OHSAS 18001
BSI British Standard – Occupational Health and Safety Management Systems.

Introduction

HSE Manual is the basic document which provides information about the HSE works to be applied during the Maintenance, Project, Troubleshooting or Operation and defines the health and safety roles and responsibilities. This plan (instructions, procedures, worksite plans, hazard analyses, etc.) is communicated to all Employees through the appropriate communication channel.

Zorlu O & M considers the basic principle in the work security management system as planning and giving operability to the preventive actions which will prevent the occurrence of any unexpected incident (proactive approach) which may injure employee or cause any damage to property or other things.

The elements are consistent with Zorlu O&M Occupational Health and Safety policy, environmental policy, ISO 14001 and OHSAS 18001.

The General Health and Safety Manual provides information for people who are involved in health and safety in the workplace. The manual is designed to provide practical guidance on a range of health and safety issues. It is not possible to cover everything, therefore, advice and detailed procedure reference is given to obtain further information.

Policy and Statement

The responsibility for health, safety, environment and security within Zorlu O & M operating in Pakistan is placed upon all personnel working within the company.

This statement, therefore, makes specific commitments with regard to how we operate, and address personal safety, welfare, and damage to property, security (both individual and property), protecting the environment, reducing losses and liabilities and full compliance with local statutory requirements.

This statement will therefore govern each of us in our work, and we will undertake to implement these commitments by,

PREPARED BY	CONTROLLED BY	APPROVED BY
JUNAID RAFIQUE	FATIH MEHMET NOHUT/SHAHID ALI	/OKTAY ERTUĞRUL/SECKIN DEMIR/MUSHTAQ AHMED

a) Personal involvement of senior management;
b) Ensuring that effective arrangments exists for communications discussion on Health & Safety matters at all levels;
c) Setting and monitoring personal safety objectives throughout the company as appropriate.
d) Fulfilling the company's duty of care for Employees.
e) Ensuring the provision of adequate instruction, training, and supervision to enable work to be carried out safely.
f) By the provision of safe premises and work places including access enter to and exit from them.
g) The provision of well maintained plant and safe systems of work;
h) The appointment of competent people to assist us in meeting our statutory duties including, where appropriate specialists from outside the company.

We will ensure that priority is given to matters of safety and adequate resources ,funds are available to support actions and initiatives that have been developed. Targets for improving safety standards will be set, in accordance with the company's "Zero Accident Philosophy" and in recognizing regulatory requirements which may be regarded as the minimum level of achievement, when performance is measured against them.

This statement, the Health & Safety at Work Policy and all other appropriate detailed arrangements for Health & Safety will be provided for the information and guidance of all who work within the company. Arrangements shall in place to ensure that all company personnel (to which this policy applies) are familiar with this document and consider its relevance to all tasks, which they undertake.

The company Site Manager has the overall responsibility on Health & Safety. His responsibilities are at the following:

Site Manager Responsibility

- To ensure that the health, safety and welfare of all permanent and temporary staff and others affected by work.
- To ensure that all risk assessments are carried out and the work programmed to ensure compliance with the appropriate legislation and the company policies and procedures.
- To ensure that effective emergency arrangements are place to deal with incidents/ accidents and emergencies / evacuation.
- Taking all reasonable and practicable steps to ensure and improve the health, safety and welfare of all staff, contractors, persons affected by work and visitors.
- Ensuring that contracts with third parties have safe systems of work and abide by the company's Health and Safety Policies and rules.
- The necessary information, instruction and training are provided to visitors.

Responsibilities of Safety Engineer

Applies the secure working methods in the hazard and Environmental impact risk analysis on the HS and Environmental subjects.

- Performs the site supervision for safe working of the workers.
- Ensures the safe usage of the PPE and hand tools, equipments which are used by the employees.
- Establishes the site communication together with the other site employees.
- Provides the workers with the health and safety trainings relating to their own duties.
- Ensures the order and arrangement on the working area.
- Takes duty in the incident accident researches.
- Takes part in the emergency situation emergency team.
- To ensure that all risk assessments related to mechanical works are carried out and the work programmed to ensure compliance with the appropriate legislation and the company policies and procedures.
- Ensure that arrangements, are in place, for fire precautions management for all those for whom they are responsible.
- All necessary equipment and systems are provided, maintained and are safe without known risks to health.
- All mechanical materials and mechanical equipment purchased by the company complies with the legislative requirements and/or manufacturers recommendations and that information is available to employees to enable their safe use.
- The use, handling and storage of articles and substances is conducted safely without known risks to health.
- That special attention is paid to the training of young or inexperienced employees or those that have special needs.
- All injuries and dangerous occurrences or situations which arise in the area of responsibility are reported according to the procedure contained in the Accident Reporting Policy at the earliest opportunity.
- The place of work is maintained in a condition which is safe without known risks to health.

Responsibilities of Electrical Engineer

- To ensure that all risk assessments related to electrical works are carried out and the work programmed to ensure compliance with the appropriate legislation and the company policies and procedures

- A duty of care for all visitors and contractors whilst within the area for whichthey have responsibility and control.
- Ensure that arrangements, are in place, for fire precautions.
- All necessary equipment and systems are provided, maintained and are safe without known risks to health.
- All electrical materials and electrical equipment purchased by the company complies with the legislative requirements and/or manufacturers recommendations and that information is available to employees to enable their safe use.
- The use, handling and storage of articles and substances is conducted safely without known risks to health.
- All injuries and dangerous occurrences or situations which arise in the area of responsibility are reported according to the procedure contained in the Accident Reporting Policy at the earliest opportunity.
- The place of work is maintained in a condition which is safe without known risks to he alth.

Workers

- Works safely at his own job.
- Informs all of the near accident, hazardous situations and behaviors, accidents and Injuries occurred in the site to his superior or the health and safety personnel.
- Takes measures at his own job, in the manner not to risk the other employees.
- Performs maintenance and keeps in good condition of the safety materials.
- Ensures the order and arrangement in the working area.
- Collects the wastes in the stated appropriate places.

SAFETY REPORTS/MEETINGS AND NOTICES

Accident Reports

All accidents are to be immediately reported orally to the supervisor in the cases described below and will be followed by a written report.

- All fatal injuries.
- All injuries requiring first aid treatment.
- All damages, to the Owner's or Contractor's properties.
- All fires.
- All releases or spills of hazardous materials.

A written accident report shall describe in detail the circumstance, and include the results of the accident investigation and analysis. This report describes the accident classification, cause, time, date, location, etc. Written incident reports shall be submitted to Safety Manager/Engineer and Plant Manager within 12 hours.

Safety Meeting

A safety committee meeting shall be held on a weekly basis and chaired by Safety Engineer and attended by all Staff.
All Staff members prior to holding a meeting shall conduct a joint site safety inspection and the inspection results shall be discussed at the meeting.

Corrective Action

When any Staff member is detecting observing negligence of safety and/ or unsafe practices He shall immediately advice d and or instruct the related worker to correct them.
If the worker fails to heed the instruction or advice or neglects fire precautions described in the work permit, Hse Engineer shall issue the letter of instruction for corrective action. The unsafe work will be stopped. The work will not commence again until corrective action has been taken.

Daily safety inspections

Daily,Monthly,three Monthly(can be sceduled according to the Site operation) safety checks shall be made by one of the Field Safety supervisor(of workers) who will record and submit 1 copy of safety check list to the safety Engineer/Manager.

Safety Orientation and Education
It is mandatory for each employee to attend the Safety Orientation program on his first day of work. No worker will be permitted to work on the site without attending the Safety Orientation Program and attached safety requirements. The orientation will be given by Safety Engineer/manager,

- Brief explanation of the program.
- Safety/ Security control policy.
- Outlines of applicable regulations and requirements for the Site.
- Emergency procedures.
- First aid services & each worker's responsibilities.

Project Management

Assessment and management of HSE risks is an integral part of all phases of project work, including design, construction and decommissioning.

Projects are activities with a predetermined time frame. Their unique character may introduce new hazards and risks into the workplace, which requires planning to ensure risks are controlled.

In order to identify the specific HSE hazards, as well as assess and control the HSE related risks, Zorlu O & M ensures that its project management systems and practices include consideration, consultation, documentation and communication of HSE aspects in all phases of project work, business case, design, procurement, site works, commissioning; decommissioning,finalization,and close out.

Technical elements for design, construction and commissioning (including any modifications) are compliant with legislation and relevant industry codes and elements. Sound engineering practices and risk management principles are utilized (e.g., quantified risk assessment, HAZOPS, and HSE reviews).

Project plans consider HSE issues and incorporate controls establishing technical integrity and HSE specifications. HSE requirements are established, documented and understood.

Design reviews for construction, operation and maintenance of plant, equipment, and systems ensure that HSE risks are identified, addressed and documented.

Zorlu O & M implements and maintains controls related to purchased goods, Equipment and services for project related work.

Contractors & suppliers in Zorlu O & M

Contractors & suppliers to our workplace align their HSE culture to ours.Aligning with our way of doing things is aimed at preventing harm to personnel, members of the public, the environment.
Zorlu O & M maintains criteria for contractors and suppliers to check that their HSE systems, capability, experience, equipment, materials, products, plans, and/or services align with Zorlu O & M HSE requirements and Contractor Management submit their HSE rules to Zorlu O&M which will reviewed and checked by Safety Engineer /Manager ,get approval.

All safety related equipment, things will be responsibility of Contractor.

Zorlu O & M ensures appropriate consultation, communication and agreement takes place regarding the identification and control of HSE risks from specification through to completion of the works.

Zorlu O & M ensures that the scope, specifications and site boundaries for the work are clear and agreed.

Zorlu O & M ensures that actions to control HSE risks associated with the work being done by contractors on Zorlu O & M-controlled sites are identified and agreed.

Zorlu O & M ensures that work on plant and/or assets by contractor's meets contract requirements.

Contractors are not permitted to subcontract work to other contractors without prior approval from Zorlu O & M.

Emergency preparedness

Plans and procedures are in place to respond to foreseeable emergencies in order to minimize any adverse impact on the health or safety of people or the environment.

Zorlu O & M maintains a system to identify potential emergency situations.Emergency response priorities are considered in the following order,

- Health and safety of people
- protection of the environment
- preservation of reputation and operability of Zorlu O & M
- Financial risk.

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

Specific emergency response plans are developed and maintained for Zorlu O & M operating sites and/or premises. These plans provide instructions to manage an emergency, and establish roles and accountabilities for emergency response tasks.

Training is provided to staff and contractors.

Emergency response plans include management of incident communications,notification and reporting to both internal and external stakeholders.

These plans are tested and reviewed. Plans incorporate improvements based on findings from post-emergency events, exercises and drills.

Management review

PREPARED BY	CONTROLLED BY	APPROVED BY
JUNAID RAFIQUE	FATIH MEHMET NOHUT/ SHAHID ALI	/ OKTAY ERTUĞRUL / SECKIN DEMIR/ MUSHTAQ AHMED

The overall effectiveness of the HSE Management System is assessed by Zorlu O&M to ensure that its suitability, adequacy and effectiveness continue to meet our ongoing HSE requirements.

There is an annual or event-based management review for the HSE Management System. These reviews are conducted by the Executive Leadership Team to determine the continuing adequacy, suitability and effectiveness of the system. This includes review of audit results, incident reports, performance reports, including annual staff survey results.

The review establishes performance against objectives and associated measures, and establishes objectives and targets for the next year.

The review is documented. This includes observations, conclusions, recommendations, actions and follow-up requirements. An action register is used to manage the review outputs and to assign management responsibility.

Findings from the review are used to set Zorlu O &M HSE objectives to drive continual improvement.

A monthly report of the HSE Management System encompasses a summary, including
Injury trend analysis,
High potential HSE incidents
HSE audit findings
Non- conformance reports

Information gathered from non-conformance and incident investigation is analyzed to Identify lessons and monitor trends. This information is reviewed in order to improve Elements, systems and practices. Learnings are shared across Zorlu O & M,

Relevant messages from reviews and reports are made available for communication throughout the business.

Genaeral Plant Regulations

Employee Requirements

All employees must be in good physical condition, i.e. appear healthy, have adequate hearing and sight, possess all limbs, do not suffer from light-headedness, etc.

Vehicles and Equipment

Employees will comply with all safety rules and signs regarding traffic and vehicle use. Vehicles must be parked only in areas approved by Site Manager/Designated area. If these areas include factory roadways, vehicles must only park on the sidewalk that traffic signs allow parking. Without such traffic signs, parking is prohibited. This is to Permit access of emergency vehicles at all times

Speed limit within the site is controlled according to site and road condition, but must not exceed maximum 35 Km/hr.

The engines of all vehicles and equipment should be stopped (switched OFF) during refueling.

All equipment, machinery and tools for use on the job site must be approved and Calibrated, and shall be subject to initial and periodic inspection by safety engineer/Manager. Any equipment, machinery and tools, which have not been approved, must be removed from the site.

Alcohol and/ or Controlled Drugs

Alcoholic drinks and / or Controlled Drugs are not to be used or allowed on the site at any time.
Anyone found under the influence of, or in possession of, alcohol or Drugs will be immediately removed from the site and refused future access.

Smoking

Smoking is not permitted except in specified areas in substation building. There is designated smoking area for smoking outside the control building.

Smoking is not allowed in any section of the substation (except designated area).

Matches and lighters are not allowed in the plant. Cigarette butts should be discarded only in proper receptacles.

Environmental Control

All employyes are responsible for the environmental control specified for the job site including all equipment and machines used.

Do not dispose of any used oil or liquid waste direct to the ground, pit or storm drain.

Dispose of these materials only in properly labeled containers.

Safe Ware Housing and Storage

Storage areas should be properly designated and clearly marked. Plans and procedures are in place to minimize any adverse impact on the health or safety of people or the environment for those involved in warehousing and storage, to reduce the number of injuries and cases of occupational ill health. It contains simple advice that you should be able to apply to your Plant. You can find more information in Warehousing and storage procedure further.

Safe Subation Operation and Record

Substations can be dangerous environments to work in if you do not keep yourself aware of the hazards that are present.

Zorlu O&M has trained staff for its operation and detailed procedure and inhousing safety trainings to nalyse and aware the employees about the hazards.These procedure ensures the safe operation (with proper Electrical signs) and proper record keeping and inspection of the equipments and operation.

Personal Safety Equipments

General

Each Staff Supervisor during work is totally responsible for providing personal protective equipment for the protection of their employees as needs or requested.
All tools and equipment are required to be maintained in good working condition. The Safety Supervisor shall inspect all tools and equipment periodically.

Head Protection ,Safety hats or helmets should be high class rigid.Any modification of the safety helmet, especially punching holes in shell, is prohibited. Safety glasses .

Hand gloves , Safety shoes ,harness Belt,Knee and other safety equipments can be wear depending on the nature of work (knee protection,elbow protection...)

Eye and Face Protection ,Protection of the eyes and face from physical or chemical agents are of prime important .

Safety Belts (or Harness), Lifelines and Lanyards should be worn while working elevation is 3 m high form ground or platform level.

While climbing to wind turbine weather conditions should also be considered and one person should be aler to inform about weather conditions to working team on turbine through wireless walky talky .
Wind limits and other safety precautions should be followed according to the Wind turbine Safety precaution Manual provided by vender.

SIGNS, SIGNALS AND BARRICADES

Accident Prevention Signs, Tags and Markings.

When hazardous work is to be performed the appropriate signs and symbols must be posted proir to starting work and must be removed or covered promptly when the hazards no longer exist.

Danger signs must be used only where an immediate hazard exists.

Caution signs must be used only to warn against potential hazards or to caution against unsafe practices.

Accident prevention signs,tags and markings are used as a temporary means of warning employees of an existing hazard, such as defective tools,equipment, etc., until the defective equipment can be repaired or removed.

FIRE PROTECTION

All employees must know where fire extinguishers are and how to use them.

Flammables (chemical,oil other)shall be stored in properly labeled contianers ,Detail is provided in warehousing and storage procedure.

Accumulation of trash, oily rags, combustible materials and similar fire hazards of any nature will not be permitted.

All alleyways, driveways, roads, stairway, ladder and transformers shall be kept clear of hazardous material and equipment.

Refueling of petrol and diesel equipment shall be done only in prescribed areas and with approved equipment. Refueling equipment with the engine running is prohibited.

Employees shall take all measures to minimize spills and to clean up immediately and spills which may accidentally occur.

Fire Fighting Equipment

Fire fihgitng equipment should be maintained and tested periodically and safety Engineer shall check the maintainance of fire extinguisher and fire fighting equipment to sure that it will be active & available all times at the site and site office.

There must be a fire extinguisher, water hose or other fire control equipment easily accessible for each section of grid station,or on work places.

During any hot work operation, a pressurized fire hose and fire extinguisher must be provided at place of hot work.

Fire extinguisher shall be maintained and checked for expiry dates ,Empty and in case empty it should be sent for refilling.

All personnel shall be properly trained and know how to use such extinguishers and fire hose .

Detailed training for using fire fighitng equipments (deluge firefighting system) is provided in firefihgting training procedure.

First Aid Procedures

Artificial Respiration

Electric shock, gassing, drowning, or suffocation may cause breathing to stop.

Artificial respiration must be started immediately and continued until the patient recovers or until professional medical aid takes over. If you are alone, do not leave the patient to seek help until his normal breathing has resumed.

Head Injuries

Action in cases of head injury is to get the patient under medical care without delay.

No head injury should be regarded lightly.

Every patient who has had even a mild injury to the head is liable to develop complications, which can be serious. Treatment shall be as follows.

Loosen all tight clothing around neck, chest, and waist.
Check to see if the patient is breathing and initiate artificial respiration, if requird.

Ensure that his throat and air passages are clear of secretions, foreign bodies, and false teeth. Check for other injuries

Arrange for the patient to be care fully transported to a hospital

Bleeding

Every effort should be made to stop bleeding by direct pressure such as by applying a sterilized pad or dressing.

The wound should be firmly bandaged. Applying mild pressure on the artery between the wound and the heart may control arterial bleeding.

Fractures

Where a fracture is suspected, the limb must be immobilized . If possible, the injured part should be removed to reduce discomfort and swelling.

Fracture of the spine or pelvis must be treated with great care.

Emergency Treatment of Burns

There are many different types of burns. They can be thermal burns, chemical burns, electrical burns or contact burns. Each of the burns can occur in a different way, but treatment for them is very similar.
Thermal burns are caused by contact with open flames, hot liquids, hot surfaces and other sources of high heat.

1. Stop the burning. Remove the victim from the heat source.
2. Cool the burn with cold water.

3. Check breathing. Stop bleeding.
4. Cover the burn with sterile pad or clean sheet.
5. Maintain body temperature and take the victim to the nearest medical facility.

Note : Do not apply oils, sprays or ointments to a serious burn.

Sunburn may also be cooled with water. If the sunburn is severe or is very extensive, seek medical attention.

Chemical Burns

1. Flush skin with water for at least 20 minutes.
2. Remove contaminated clothing, but avoid spreading the chemical to unaffected areas.
3. If the victim's eyes are involved, flush the eyes continuously with water until medical help is obtained. Remove contact lenses.
4. Follow steps 3 to 5 for thermal burns.

Note: In cases involving some powdered or dry chemicals, it may not be appropriate to flush with water. If a dry chemical is involved, carefully brush the chemical off the skin and check the package or package insert for emergency information.

Electrical Burns

1. Pull the plug at the wall or shut off the current. Do not touch the victim while they are in contact with electricity.
2. Once the victim is clear of the power source, check breathing and circulation.
3. Follow steps 3 to 5 for thermal burns.
3. All electrical injuries should receive medical attention.

General considerations

- Remove rings, belts, shoes and tight clothing before swelling occurs.
- If clothing is stuck to the burn, DO NOT REMOVE IT. Carefully cut around the stuck fabric to remove loose fabric.
- Do not scrub the burn and do not cover the burn with anything.
- Keep the victim warm and try to maintain normal body temperature.
- Burns on the face, hands and feet should always be considered serious and should receive prompt medical attention.

Fire is Fast

THERE IS LITTLE TIME

In less than 30 seconds a small flame can get completely out of control and turn into a major fire. It only takes minutes for thick black smoke to fill a room.

Fire is Hot

HEAT IS MORE THREATENING THAN FLAMES
A fire's heat alone can kill. Room temperatures in a fire can be 100 degrees at floor level and rise to 600 degrees at eye level. Inhaling this super hot air will scorch your lungs. This heat can melt clothes to your skin. In five minutes a room can get so hot that everything in it ignites at once: this is called flashover.

Fire is Dark

FIRE ISN'T BRIGHT, IT'S PITCH BLACK.
Fire starts bright, but quickly produces black smoke and complete darkness. If you wake up to a fire you may be blinded, disoriented and unable to find your way around a home you've lived in for years.

Fire is Deadly

SMOKE AND TOXIC GASES KILL MORE PEOPLE THAN FLAMES DO.
Fire uses up the oxygen you need and produces smoke and poisonous gases that kill. Breathing even small amounts of smoke and toxic gases can make you drowsy, disoriented and short of breath. The odorless, colorless fumes can lull you into a deep sleep before the flames reach your door. You may not wake up in time to escape.

Fire Safety Tips

IN THE EVENT OF A FIRE, REMEMBER TIME IS THE BIGGEST ENEMY AND EVERY SECOND COUNTS!

- **Escape first, and then call 115. Develop a fire escape plan and designate a meeting place outside.**
- **Make sure everyone knows two ways to escape from every room.**
- **Practice feeling your way out with your eyes closed.**
- **Never stand up in a fire, always crawl low under the smoke and try to keep your mouth covered.**
- **Never return to a burning building for any reason; it may cost you your life.**

How to Identify the Proper Fire Extinguisher

- All ratings are shown on the extinguisher faceplate. Some extinguishers are marked with multiple ratings such as AB, BC and ABC. These extinguishers are capable of putting out more than one class of fire.
- *Class A and B* extinguishers carry a numerical rating that indicates how large a fire an experienced person can safely put out with that extinguisher.
- *Class C* extinguishers have only a letter rating to indicate that the extinguishing agent will not conduct electrical current.
- *Class C* extinguishers must also carry a *Class A* or *B* rating.
- *Class D* extinguishers carry only a letter rating indicating their effectiveness on certain amounts of specific metals.

INFORMATION AND COMMUNICATION

The company will ensure that all appropriate information regarding health and safety is provided to all appropriate staff and other persons concerned.

Individual Manager of their staff is responsible for ensuring that this policy is applied within their own area/team. Any queries on the application or interpretation of this policy must be discussed with Site Manager/HS Engineer.

The involvement and active participation of management, employees, contractors and stakeholders is essential in achieving Zorlu O & M HSE objectives.

With regard to its HSE Management System, Zorlu O&M has established, implemented and maintains procedures for,

- Internal communication among the various levels and functions of the organization,
- communication with contractors and other visitors to the workplace and receiving, documenting and responding to relevant communications from external interested parties including stakeholders.

Zorlu O&M has established, implemented and maintains procedures and programs for the participation of employees and contractors by their appropriate involvement in hazard identification, risk assessments, and determination of controls,

- appropriate involvement in incident investigation,
- involvement in the development and review of HSE policies, objectives, work practices, consultation and representation on HSE matters.

Employees are informed about their participation arrangements, including who their representatives are on HSE matters. Contractors are informed and consulted, where there are changes to the HSE Management System that affect them.

Annexure M

O & M Training Records

ZORLU O&M TRAINING RECORD SHEET					
S.NO	TRAINING COURSE	INSTITUTE/COMPANY	DURATION	ATTENDEES	PLACE OF TRAINING
1	Work at Height (WAH)	KAYA TRAINING (TURKISH)	3 days	ZOMP	ZORLU SITE JHIMPIR
2	Fire Fighteing & First aid	CISCO Consultant	1 DAY	ZOMP	ZORLU SITE JHIMPIR
3	Health, safety and environment	CISCO Consultant	2 Days	ZOMP	ZORLU SITE JHIMPIR
4	Basic Safety Training	VESTAS	12 Hours	ZOMP	ZORLU SITE JHIMPIR
5	VENSYS62 Operation and Maintenance techinical training	ZORLU TURKEY	3 days	ZOMP	ZORLU SITE JHIMPIR
6	Work at Height (WAH) and PPEs use	IPEK GmbH Consultant	1 Day	ZOMP	ZORLU SITE JHIMPIR
7	Root cause failure analysis of bearing	SKF pakistan	2 day	Mr.Shahid Ali /Mr.Nadeem	Karachi
8	HSE and Risk assesment	Institute of Enviroment Engineering and Management	5 Days	Shahid Ali	Mehran UET jamshoro

Annexure N

Risk Assessment Sheet

ZORLU O&M

FORM NO: 2
REV NO: 0

RISK ASSESMENT

Work permit number: Date :

DEFINITION OF RISK

☐ Working height	☐ Crash	☐ Springing particules
☐ Electric	☐ Tripping	☐ Noise
☐ Falling objects	☐ Confined space	☐ Poison
☐ Lifting operation	☐ Heat stress	☐ High Oil pressure
☐ Excavation works	☐ Rotary machine	
☐ Other	☐ Fire	

Precaution

Proper PPE

☐ Helmet	☐ Slider	☐ Safety glasses
☐ Harness	☐ Glove	☐ Shock absorber
☐ Mask	☐ Ear plug	☐ Safety boot
☐ Others		

Prepared by Approved by

Annexure O

Emergency Response Procedures

Electrical Engineer	Jalil Ahmed
Electrical Technician	Ghulam Abbass
Electrical Technician	Ismail Chandio
Control Room operator	Asghar Ali
Control Room operator	SanaullahLakhmir

The Emergency Response Management Team is designed to take charge and manage any emergency situation affecting Power Station: Natural Disasters, Major Oil Spills or in case fire etc.

The Emergency Response Management Team will utilize the recourses of all members of staff as needs require achieving its objective, therefore members of staff should be informed to be on standby in case their service is required. All members should avail themselves for such response.

Assembly Point

In case of any emergency in plant, alarm button will be pushed and exit by using exit doors (5) tagged in green color as "Emergency Exit" to the assembly point designated in garden near security guard room in open area.

1-Assemblly point located in garden near security guard room (open area).

System Equipments:

As risk of other emergencies due to earth quake, spills of material or flood etc is very low so system is designed according to the risk assessment and as compare to other emergencies chances of fire is high . Deluge fire fighting system is installed in the control building which can cover all control building in case of fire. Hose pipe, hydrants Portable and portable fire extinguishers, are placed in following location,

Electrical Engineer	Jalil Ahmed
Electrical Technician	Ghulam Abbass
Electrical Technician	Ismail Chandio
Control Room operator	Asghar Ali
Control Room operator	SanaullahLakhmir

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1-Control Room (there are 4 boxes in which hose pipes and portable fire extinguishers are placed).

2-Switch Yard (There are 3 boxes in which hose pipes and portable fire extinguishers are placed).
3-Outside control building (There are 2 boxes contains hose pipes and portable fire extinguishers).

4-Security Guard Room (There is one portable fire extinguisher outside the security guard room).

5-Fire fighting Room (one box and there is one portable fire extinguisher outside the firefighting room).

Personal Protective Equipment

All PPE's are placed in the common store room near assembly point outside the control building, in case of emergency these are easily accessible.
Evacuation Procedures:

1. Supervision during the emergency

The staff assisted by the area supervisors/ Emergency response team, will supervise the evacuation of the fire the area Stewards will assist in ensuring evacuation and report to the Plant Manager or Emergency response team of any persons missing or unaccounted for.Re-entry into the office/camp housing after a fire shall only be upon authorization by the Emergency response team.

2. Person discovering a fire

A-Push Fire alarms at nearest box. These alarms will automatically sound alarms throughout the OFFICE.
B-Recruit assistance from persons in vicinity if possible.

C-Call 16 (Fire Brigade) report name, location, description of emergency

D-If trained, use fire extinguishers to aid in evacuation and to confine the area of the fire

E-Remove victims in the immediate area of the fire

F-Confine fire by closing doors and windows in vicinity of fire

3. All Personnel

A. All office housing occupants will exit the building upon announcement or sounding of the fire alarm.

B. Close doors, corridor smoke barrier doors, and windows in the vicinity.

C. Shut off potentially dangerous equipment, reactions or experiments in the work area.

D. Assist all injured or disabled persons from the office.

E. Report to the designated assembly area, if designated assembly area is involved with smoke, report to another assembly area.

4. Fire Action Plan

- Any person Discovering Fire Raise Alarm By shouting Fire..... Fire..... Fire.....
- Push Fire Alarm Button to activate the alarm in overall building.
- Leave the office and report to Assembly point.
- Inform to Emergency Response person.

PREPARED BY	CONTROLLED BY	APPROVED BY
JUNAID RAFIQUE	H MEHMET NOHUT /SHAHID ALI	OKTAY ERTUĞRUL/SECKIN DEMIR/MUSHTAQ AHMED

The Emergency Response Management Team Contact Numbers

Position	Person
Plant Manager	Mushtaq Ahmed (03341111342)
Mechanical Engineer	Shahid Ali (03343941352)
Electrical Engineer	Zubair Ahmed (03323414070)
Control System Engineer	Junaid Rafique (03332562607)
Electrical Engineer	Jalil Ahmed (03312322535)
Electrical Technician	Ghulam Abbas (03312166191)
Electrical Technician	Ismail Chandio (03337010652)
Control Room operator	Asghar Ali (03150333588)
Control Room operator	SanaullahLakhmir (03353328852)

Emergency Telephone Numbers
Ambulance 115
Police: 15

PREPARED BY	CONTROLLED BY	APPROVED BY
JUNAID RAFIQUE	H MEHMET NOHUT /SHAHID ALI	OKTAY ERTUĞRUL/SECKIN DEMIR/MUSHTAQ AHMED

Fire Brigade 16

EMERGENCY PLAN

- ALL PERSONNEL must be familiar with emergency procedures that are in place in the office.
- Push fire alarm Button sounds.

- Security will be contacted in the gate house.
- Do not attempt to gather your personnel belongings.
- Do not attempt to fight the fire unless trained and authorized.
- Immediately leave the site office/camp housing by the nearest safe exit.
- Proceed to the assembly point (unless otherwise directed by security).
- Do not re-enter the site office /camp housing until security has indicated that it is safe to do so.

Fire is fast

THERE IS LITTLE TIME

In less than 30 seconds a small flame can get completely out of control and turn into a major fire. It only takes minutes for thick black smoke to fill a room.

Fire is Hot

PREPARED BY	CONTROLLED BY	APPROVED BY
JUNAID RAFIQUE	IH MEHMET NOHUT /SHAHID ALI	OKTAY ERTUGRUL/SECKIN DEMIR/MUSHTAQ AHMED

HEAT IS MORE THREATENING THAN FLAMES

A fire's heat alone can kill. Room temperatures in a fire can be 100 degrees at floor level and rise to 600 degrees at eye level. Inhaling this superhot air will scorch your lungs. This heat can melt clothes to your skin. In five minutes a room can get so hot that everything in it ignites at once: this is called flashover.

Fire is Dark

FIRE ISN'T BRIGHT, IT'S PITCH BLACK.

Fire starts bright, but quickly produces black smoke and complete darkness. If you wake up to a fire you may be blinded, disoriented and unable to find your way around a home you've lived in for years.

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SMOKE AND TOXIC GASES KILL MORE PEOPLE THAN FLAMES DO.

Fire uses up the oxygen you need and produces smoke and poisonous gases that kill. Breathing even small amounts of smoke and toxic gases can make you drowsy, disoriented and short of breath. The odorless, colorless flames can lull you into a deep sleep before the flames reach your door. You may not wake up in time to escape.

Fire Safety Tips

IN THE EVENT OF A FIRE, REMEMBER TIME IS THE BIGGEST ENEMY AND EVERY SECOND COUNTS!

- **Escape first, and then call 16. Develop a fire escape plan and designate a meeting place outside.**
- **Make sure everyone knows two ways to escape from every room.**
- **Practice feeling your way out with your eyes closed.**

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- All ratings are shown on the extinguisher faceplate. Some extinguishers are marked with multiple ratings such as AB, BC and ABC. These extinguishers are capable of putting out more than one class of fire.
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- *Class C* extinguishers have only a letter rating to indicate that the extinguishing agent will not conduct electrical current.
- *Class C* extinguishers must also carry a *Class A* or *B* rating.
- *Class D* extinguishers carry only a letter rating indicating their effectiveness on certain amounts of specific metals.

First Aid Procedures

Emergency Treatment of Burns

There are many different types of burns. They can be thermal burns, chemical burns, electrical burns or contact burns. Each of the burns can occur in a different way, but treatment for them is very similar.

Thermal burns are caused by contact with open flames, hot liquids, hot surfaces and other sources of high heat.

1. Stop the burning. Remove the victim from the heat source.
2. Cool the burn with cold water.
3. Check breathing. Stop bleeding.

4. Cover the burn with sterile pad or clean sheet.

5. Maintain body temperature and take the victim to the nearest medical facility.

Note: Do not apply oils, sprays or ointments to a serious burn.

Sunburn may also be cooled with water. If the sunburn is severe or is very extensive, seek medical attention.

Chemical Burns

1. Flush skin with water for at least 20 minutes.

2. Remove contaminated clothing, but avoid spreading the chemical to unaffected areas.

3. If the victim's eyes are involved, flush the eyes continuously with water until medical help is obtained. Remove contact lenses.

4. Follow steps 3 to 5 for thermal burns.

Note: In cases involving some powdered or dry chemicals, it may not be appropriate to flush with water. If a dry chemical is involved, carefully brush the chemical off the skin and check the package or package insert for emergency information.

Electrical Burns

1. Pull the plug at the wall or shut off the current. Do not touch the victim while they are in contact with electricity.

2. Once the victim is clear of the power source, check breathing and circulation.

3. Follow steps 3 to 5 for thermal burns.

3. All electrical injuries should receive medical attention.

General considerations

- Remove rings, belts, shoes and tight clothing before swelling occurs.
- If clothing is stuck to the burn, DO NOT REMOVES IT. Carefully cut around the stuck fabric to remove loose fabric.
- Do not scrub the burn and do not cover the burn with anything.
- Keep the victim warm and try to maintain normal body temperature.
- Burns on the face, hands and feet should always be considered serious and should receive prompt medical attention.

Bomb Threat

- Keep caller on the line and record call (if allowed by your local laws), if possible.
- Notify the site office and evacuate the area.
- Call local law enforcement or emergency dispatch, if appropriate.

Shelters for Severe Weather condition

In the case of severe weather, lightning, earthquakes, employees should exit the turbine, And/or if in a location other than a turbine, move to an interior, Camp Main office area as quickly as possible. If in a turbine and evacuation is not possible, notify the site office, remote trip the main switchgear and take a position in the bottom of the tower. If in a location other than a turbine and time does not allow for movement, cover should be taken away from glass and under protective items such as sturdy desks. Hallways and enclosed stairwells are also acceptable shelter areas. Once individuals have reached the On Site Emergency Shelter Location (Camp Main office Office), they should assume a seated position on the floor with their heads down and their hands over their heads or place themselves under a desk. If they are wearing heavy clothing or have access to heavy clothing, they should use these items to cover their upper bodies and

heads. Once the disaster has stabilized, exit from the office and gather at the fire emergency point.

Internal Emergency Drills

Evacuation drills will be conducted under the supervision of the Zorlu O & M (QHSE Engineer normally), or his or her designee. Drills are necessary to train and prepare staff forsafe evacuation if an internal emergency occur. All fire alarms should be treated as "real" and proper evacuation conducted.

Medical Emergency Procedure

1. If the person is conscious ask them to tell you if anything hurts. If unconscious, gently inspect the person for obvious signs of injury.

2. **Do not** move the person (especially if they indicate any pain) unless they are in imminent danger of further injury.

3. Call **emergency response team** if the person is injured.

4. Call ambulance.

5. You may render first aid, but medical attention should be done by qualified medics. **Do not** come into contact with blood, vomit, or other bodily fluids without the use of rubber gloves. **Do not** provide any medicines, and get out of the way once emergency personnel arrive.

6. Limit your conversation with the person to reassurances. Do not discuss their injury if at all possible.

7. After person has been recovered from injury record the incident and report to the HSE engineer.

PREPARED BY	CONTROLLED BY	APPROVED BY
JUNAID RAFIQUE	H MEHMET NOHUT /SHAHID ALI	OKTAY ERTUĞRUL/SECKIN DEMIR/MUSHTAQ AHMED

Regular evacuation drills - One per shift, at least once annually, for a total of four drills annually.This manual is prepared and applicable for the Zorlu O & M Jhimpir plant. Information and procedure in this manual are prepared according to current location and available safety equipment in the plant as to handle & proper evacuate of emergency situations.

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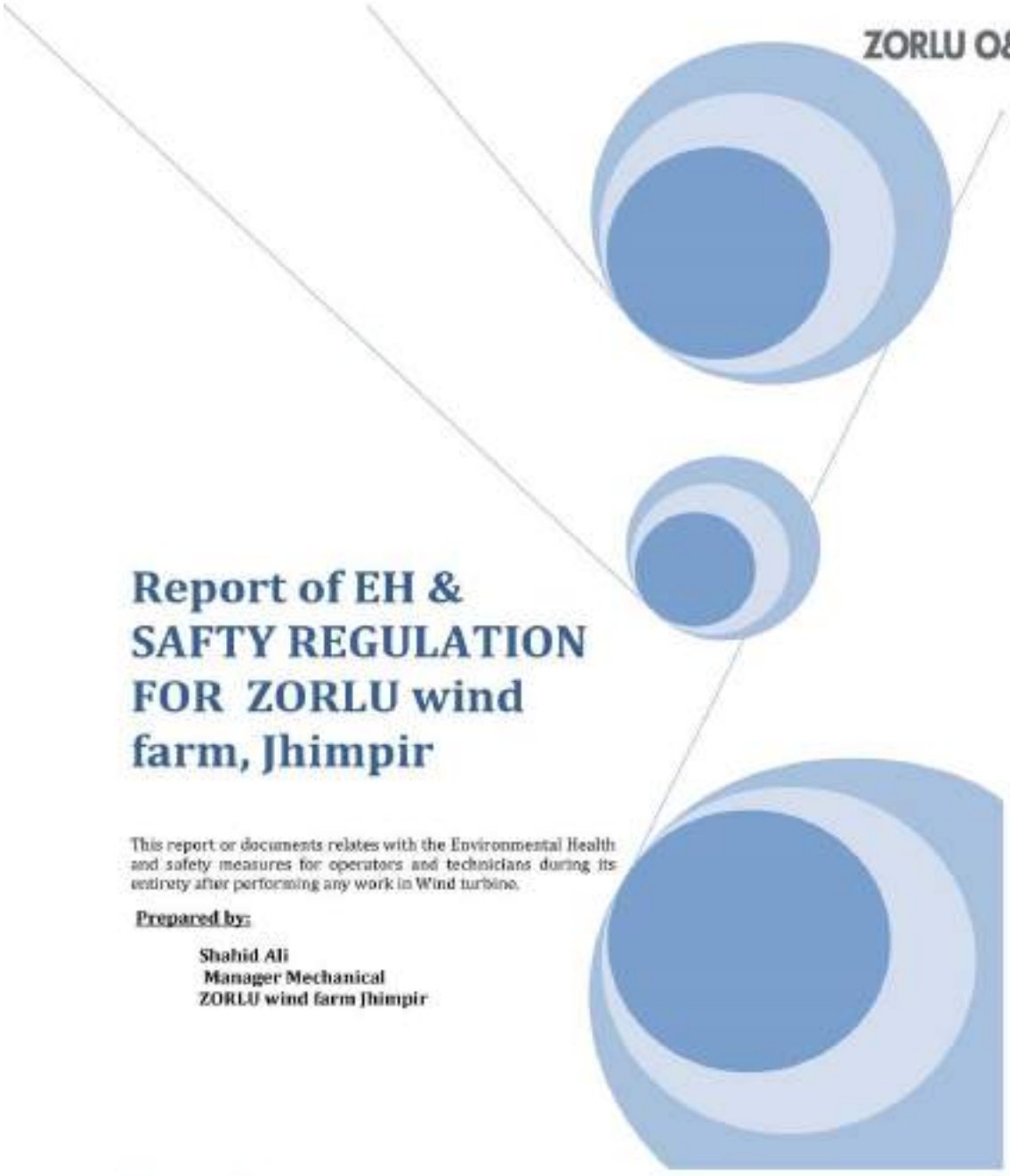
Annexure P

EHS Régulations during O & M Phase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Report of EH & SAFTY REGULATION FOR ZORLU wind farm, Jhimpir
This report or documents relates with the Environmental Health and safety measures for operators and technicians during its entirety after performing any work in Wind turbine.
Prepared by:
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ZORLU wind farm Jhimpir
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1. SAFETY

All work involved in the construction, operation and maintenance of a turbine, including work methods and practices, employee training and protective measures, and use of tools and equipments, shall be in accordance with the requirements of occupational safety and health codes and standards. The service technicians or operators must be familiar and comply with 'EHS Manual' also related documents that are holding specific turbine safety instructions for the relevant turbine types and work at height, service technicians must be aware of using "Personal Protective equipments" .

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2. EDUCATIONAL REQUIREMENTS OF SERVICE TECHNICIAN

At least two of the service technicians working in a wind turbine are required to possess valid course certificates for the work at height (WAT) basic Safety Training for Service Technicians including...

- Basic safety theory,
- First aid,
- Fire prevention and fire fighting,
- Emergency descent or Emergency Rescue training
- Any additional safety courses owing to local requirements.

3. PURPOSE

This report describes how to enter and shut down the turbine to make a safe work environment before starting any work task. This document is applicable for the following turbine types.

- VENSYS 62 (1.2 MW)
- VESTAS V80/90-1.8/2.0 MW

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4. INTRODUCTION

A turbine connected to the grid implies various elements of danger if it is handled without proper. Work in the turbine must be carried out in accordance with this manual and related documentation. This implies that all personnel must be instructed in and familiar with relevant parts of this report. Precautions must be taken in account in situations where measurement and work is done when connected to power. Consequently, the following safety regulations must be read and understood before entering the turbine.

5. General Precautions

Prior to entering a wind turbine or work, note the following:

- Address and phone number for the turbine.
- Phone number for local emergency service.
- Always bring a torch in case of power failure.
- First aid, descent and fire-fighting equipment must be available close to the work area.
- Only approved anchorage points must be used.

5.1 Out side

Weather Conditions

- Evaluate the weather conditions before entering a turbine.
- Be aware of changing weather conditions.
- Assess the wind speeds and limits.
- Do not access the turbine or site during extreme wind conditions (storms, hurricanes and Tornadoes).

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High Temperature and Sunny Conditions

- Bring and drink plenty of water to avoid dehydration.
- Go to a ventilated place whenever possible.
- Wear the appropriate clothing for the environment.

Thunderstorms and Lightning

- Do not enter a turbine or substation in the event of a thunderstorm.
- Immediately leave a turbine or substation in the event of a thunderstorm.
- Do not approach the wind turbine for one hour after the storm has passed.

During installation, service, maintenance, lifting procedures, work on the nacelle or work on the ground near the turbine, etc. make sure that unauthorized persons are not in the vicinity of the turbine. If necessary, cordon off the area.

5.2 In side

For safety reasons, at least two persons must be present during a work procedure.

When entering the nacelle, there is limited access from the top section of the tower. Therefore, attention must be paid as to avoid any minor injuries while entering in the nacelle.

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6. Location Emergency Stop Buttons

The emergency stop buttons are red on a yellow background. The emergency stop is activated by pressing the red button.

- In VESTAS V80/90 (1.8/2.0 MW)

  The turbine has five emergency stop buttons.

  1) Ground Controller (At the bottom of the turbine)
  2) Top controller
  3) Main bearing House
  4) Yaw ring
  5) Nacelle bottom front

Emergency stop button (On main bearing house

Emergency stop button (At nacelle bottom)

Emergency stop button on yaw gear

Emergency stop button and Trip F60 on top controller

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6.1. Escape Routes

The turbine has the following escape routes:

Tower

- Tower door in tower bottom.
- Nacelle at tower top.

Nacelle

- Tower.
- Service hatch at the back of the nacelle (attach emergency descent device to crane traverse beams).
- Nacelle roof (attach emergency descent device to anchorage points).

6.2 Service lift

1. If a service lift is available in the turbine, always wear full body harness when using the lift.
2. Only trained personnel must use the lift.
3. Always inspect the lift prior to use according to the supplier's service manual.
4. Check lifting capacity prior to use. Persons and material must not exceed the maximum rated lifting capacity.

6.3 Safety Equipments

1. Safety helmet / climbing helmet with chin strap.
2. Eye protection.
3. Fall arrest equipment.
   a) Full body harness.
   b) Lanyard with energy absorber. Two lanyards are required if working on the nacelle roof.
   c) Positioning device to give the user extra support and a good working position.
   d) Fall arrester.
4. Protective and non-slip footwear.
5. Gloves.

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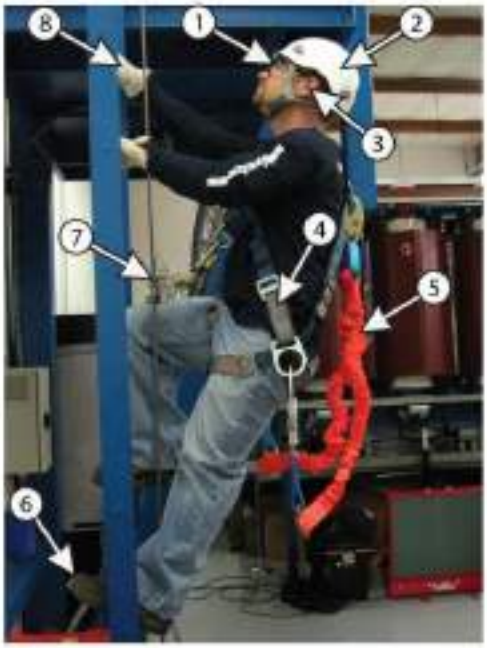
6. Hearing protection that must be used when working with or around equipment with high noise levels. The positioning rope must be hooked onto the full-body harness on the ring on the hip support.

7. Respirator or filtered masks, which must be used when excessive dust, mist, fumes, gasses or other atmospheric impurities are present due to work being performed.

Note:

When climbing the tower, fasten the fall arrest equipment (lanyard with energy absorber) directly to the D-ring on the back of the full-body harness. The large safety hook must be hooked into the ring on the hip support when not in use.



1. **Eye protection**
2. **Safety helmet with chin strap**
3. **Hearing protection**
4. **Full body Harness**
5. **Lanyard with energy absorber**
6. **Safety foot wear**
7. **Fall arrester**
8. **Gloves**

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Positioning rope

Respirator

Rescue-Emergency Rescue Equipments

In case of fire or other unforeseen events blocking the descent through the tower, a rescue and descent device can be found in the nacelle in an aluminum box behind the generator **(In VESTAS)** turbine and in **VENSYS 62** place near to the exit window to the back side of the Nacelle body. For further information.

Rescue equipment

7. Safe use of Ladder

Risk of falling objects when working/climbing from ladder inside tower

- **Do not** access a ladder occupied by another person. Only one person at a time is allowed to climb the tower ladder.
- **Do not** attach fall protection to the steps on the ladder. Only attach fall protection to approved anchorage point or to the fall arrest system on the ladder.
- Always wear personal fall arrest equipment with two lanyards.
- Loose parts or tools must not be carried in hands or in open pockets.

- Small equipment must be carried in a closed tool bag designed for the purpose, carried on the back or attached to the personal fall protective harness.
- The area underneath the ladder must be vacated during the work.
- Always close platform hatch after passing to avoid falling items.

8. Bringing tools and materials in Nacelle

Risk of falling objects

- **Do not** dismount or lower the blade without removing tools from the hub.
- Remove tools from the hub to avoid items falling from the hub.

There are three ways to bring tools up into the nacelle:

1. Carried by person on the ladder. To avoid risk of falling tools, carry them in a strong backpack.
2. Transported by person in service lift. Make sure to bring personal protective equipment in case of failure on the service lift.
3. Hoisted by internal crane. For further details about the internal crane

9. Anchorage points

Only use approved anchorage points. Anchorage points inside and outside the nacelle are shown below.

9.1 Anchorage point-Generator

Anchorage points on generator generator Front

Anchorage points on generator rare end

Anchorage points on near bottom hatch

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Bottom hatch open and safety chain mounted

9.2 Anchorage point in Roof at crane

9.3 Anchorage point in transformer compartment

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9.4 Anchorage point on Nacelle Roof out side

10. Safety Measures during working in the turbine

Before starting any work in the turbine, deactivate the remote control by turning the ground operating panel key switch to 'Local'.

The key switch plays a central role for personal safety when working in the turbine. The key switch position is used to indicate the local presence and limit remote ability to control the turbine. The key switch has three positions:

RCS: This position makes it impossible to locally operate the turbine from the operating panel, from local service panels or by using the service tool Toolkit 3.0.
In this position, remote control (SCADA, remote Toolkit 3.0, etc.) has reading and writing access.

Shift: No remote commands are possible in this key position. The turbine state 'Point of Operation' is set to 'Local' and the operating panel and the local service panels are ready to use. It is possible to set Toolkit 3.0's 'Point of Operation' to 'Local' if the Toolkit 3.0 PC is present in the turbine.
In this position, the remote control (SCADA, remote Toolkit 3.0, etc.) only has reading access.
Local: In this key position, the remote connection is physically disconnected and the remote control is unable to monitor the turbine. This ensures personal safety.

In this position, the remote systems (SCADA, remote Toolkit 3.0, etc.) are unable to communicate with the turbine.

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10.1 Working in Hub/Nacelle

Rotor lock must be applied during the entire procedure to prevent unintended rotation of the drive train.

- **Do not** work on rotating parts without applying the rotor lock.
- Mount the rotor lock before entering the nose cone or starting any work on the drive train.

Note:
Working in the hub: One person must always stay in the nacelle.

10.2 Controller

Before working on electrical parts of the controller, disconnect the controller on the circuit breakers **Q15 CONTROLLER** and **Q16 AUX SUPPLY** and lock both by means of padlocks.

10.3 Generator and Convertor

Before working on the generator terminals or the converter system, disconnect the generator on circuit breaker **Q8 GENERATOR** and **Q7 CONVERTER** and lock both by means of padlocks.

10.4 High Voltage

- An operator or service technician is not allowed access behind the covers / doors, until the high voltage is isolated, locked and visibly earthed.
- The safety precautions taken for work on high-voltage installations must be carried out by personnel specifically qualified to carry out those tasks. This person must give permission in writing before access to the HV installation is allowed.
- Work on high-voltage installations is to be carried out in accordance with national regulations and recognized safety rules for high-voltage work.
- Earthling of conductors between the point of work and point of disconnection is essential, and additional earthlings may be necessary when point of disconnection is not visible from / close to the point of work.

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10.5 Working Outside on Nacelle Roof

Only trained technicians are allowed to use personal fall protection equipment to work outside on nacelle roof.

- **Never** access the roof without wearing personal protective equipment.
- Always wear a full body harness with two lanyards and be attached to at least One anchorage point on the roof at all times.
- Always close skylight when working on the roof to avoid risk of falling through the skylight.
- Close skylight when leaving the roof.
- Be aware of icy/slippery surface.

11. Rotor Locking system

There is a risk of damaging the rotor locking system if all three blades are pitched simultaneously.

- **Do not** pitch all three blades simultaneously.
- Pitch only one blade at a time.
- Pitch blades to 90° when they are not being tested.
- The rotor locking system must not be operated while the rotor is rotating.
- Set the turbine in IDLE mode.
- Wait until all blades are in the correct IDLE position and the rotor is at a standstill (as still as it can get in IDLE mode).
- It is possible to stop/start the rotation by using the apply/release brake functionality.
- By controlling the rotational speed of the rotor, adjust the holes of the locking system, making the holes level with the locking system mandrels. Make sure that the brake is applied before continuing.
- At the correct position, set the handle in '+' position and pump the locking system mandrels out. Observe at the right-hand side during the pumping.

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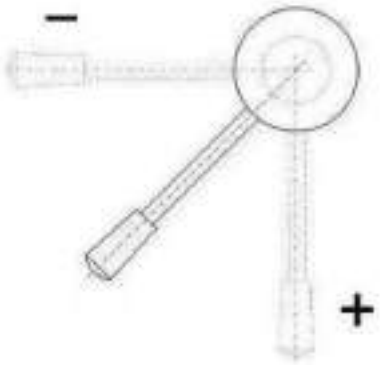

The locking takes place with the hydraulic hand pump located on the front main bearing housing. The handle is locked when positioned at 45°. When locking, set the handle in '+' position (the handle perpendicular to the main shaft). When unlocking, set the handle in '-' position and pump in the locking system mandrels

12. Blade Locking system

Risk of damage to the rotor locking system

There is a risk of damaging the rotor locking system if all three blades are pitched simultaneously.

- **Do not** pitch all three blades simultaneously.
- Pitch only one blade at a time.
- Pitch blades to 90° when they are not being tested.
- Secure the blade by pitching it into chosen position so that the M30 blade locking bolt can be fully screwed into the machined groove in the hub.
- Tighten the M30 blade locking bolt, and the lock nut. 'Blade Bearing Rotor Locking' diagrams.

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14.3 Runaway Turbine

1. In case of a runaway turbine which cannot be controlled, leave the turbine immediately and make sure that everyone is brought out of the range of any falling parts from the turbine.

2. Alert the proper authorities (police, rescue, local service department, etc).

15 In case of Fire in Turbine

In case of fire in or near a turbine;

1. If it is safe to do so, disconnect the turbine at the main high-voltage circuit breaker:

- In the nacelle: disconnect by pushing the red button (Trip F60) on the top controller.
- In the tower bottom: disconnect by pushing the red button situated on the breaker in the high-voltage section.

If it is not possible to get to the main circuit breaker, immediately contact the power station for disconnection of the grid.

2. Leave the wind turbine immediately.

- Only carry out life-saving fire-fighting.
- Only use fire-fighting equipment to ensure a safe escape route from the wind turbine.

3. Seal off the area and rope off in a radius of minimum 400 m (1300 ft) from the turbine.

4. Notify responsible manager and emergency services.

5. Assist the local fire marshal.

6. Account for all personnel on site, including visitors. Pass this information to emergency services immediately.

In case of a fire during an uncontrolled operation, do not under any circumstances go near the turbine.

In case of a fire in a non-operating turbine, the fire can be put out by means of a powder extinguisher.

Annexure Q

Site Photographes

A view of Zorlu Wind Farm

Meeting with O&M Contractor at Site Office

Oil Leakage at Generator Site Located at Operational Camp

Improper Placement of First Aid Box at Control Building

Improper Placement of Fire Extinguisher

Scrap Storage at Basement of Electrical Room

Improper Placement of Scrap

Colored Solid Waste Bin is placed at Control Building

Slippery Stairs Requiring Anti-slip Mats

Electrical Panel-Electric Shock Hazards

Inspection of Medicines at First Aid Room

Inspection of B. P. Apparatus at First Aid Room

Improper Covering of Septic Tank at O&M Camp

O & M Control Building

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