

Environmental and Social Monitoring Report

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Annual Report 2020
March 2021

Pakistan: Zorlu Enerji Power Project

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

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Zorlu Wind Power Project Environmental and Social Monitoring Report

Final Annual Report 2020

Ref.: FESMR20-ZORLU-AR-2020



March 2021

Prepared for
Zorlu Enerji Pakistan Limited

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LIST OF ACRONYMS

AEDB	Alternate Energy Development Board
ADB	Asian Development Bank
AEUP	Area Ecology Up-Gradation Plan
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
FGD	Focus Group Discussion
HESCO	Hyderabad Electric Supply Company
HSE	Health, safety and Environment
IEE	Initial Environmental Examination
IFC	International Finance Corporation
JAUP	Jhimpir Area Up-Gradation Plan
KYWDO	Keenjhar Youth Welfare Development Organization
MSDS	Material Safety Data Sheets
NCHD	National Commission for Human Development
NGOs	Non-Government Organizations
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 Equipment's
RO	Reverse Osmosis
SEPA	Sindh Environmental Protection Agency
SWMP	Solid Waste Management Plan
WBG	World Bank Group's
WWF	World Wide Fund for Nature
COVID-19	Corona Virus Disease 2019

TABLE OF CONTENTS

1.	INTRODUCTION.....	1-1
1.1	Zorlu Wind Farm	1-1
1.2	The Proponent – ZEPL	1-2
1.3	The Lender – IFC.....	1-2
1.4	The Consultant – Élan Valorisation (Pvt.) Ltd	1-3
1.5	Environmental and Social Monitoring.....	1-3
2.	ENVIRONMENTAL PERMISSIONS AND COMPLIANCE CERTIFICATES.....	2-1
3.	FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL MONITORING	3-1
3.1	Components of Environmental & Social Monitoring.....	3-1
3.1.1	Site Visits by Environmental Experts	3-1
3.1.2	Meeting with Project Personnel	3-2
3.1.3	Monitoring of Environmental Compliance Documents.....	3-2
3.1.4	Trainings and Capacity Building	3-3
3.1.5	Field Monitoring	3-3
3.1.6	Findings of the environmental and social monitoring	3-4
3.1.7	IFC Monitoring Visit	3-5
3.1.8	Emergency Response Procedure (ERP).....	3-5
3.1.9	Integrated Management System (IMS).....	3-5
3.1.10	Zorlu Energy Campsite Security Plan.....	3-6
4.	ACCIDENTS RELATED TO ENVIRONMENT /SAFETY	4-1
4.1	Accidents Related to Work Place Safety	4-1
5.	LABOR RELATIONS – LEGAL FRAMEWORK	5-1
5.1	Factories Act, 1934	5-1
5.2	Employment of Child Act, 1991	5-1
5.3	IFC-Environmental, Health and Safety Guidelines 2007	5-1
5.4	ADB’s Safeguard Policy Statement 2009.....	5-2
6.	CAPACITY FOR REGULAR MONITORING OF ENVIRONMENTAL AND SOCIAL ISSUES.....	6-1
6.1	Environmental and Social Trainings.....	6-2
7.	STAKEHOLDER CONSULTATION UNDER CORPORATE SOCIAL RESPONSIBILITY ACTIVITIES.....	7-1
7.1	Social Capacity Building	7-1
7.2	Drinking Water Supply to Local Community.....	7-1
7.3	Promotion of Education among Local Communities.....	7-2
7.4	Flood Relief Activities.....	7-2
7.5	Coordination with Local Welfare Organizations	7-2
7.6	Employment Opportunities for Local Community	7-3
7.7	Jhimpir Area Up-Gradation Program (JAUP)	7-3
7.7.1	Area Ecology Up-Gradation Plan (AEUP)	7-3
7.7.2	Sweet Water Enhancement Program	7-4
7.7.3	Socio-Economic Upliftment Plan	7-4
7.8	Promotion of Procedures for (a) Hiring and; (b) Acquisition of Local Goods and Services.....	7-4

7.9	Stakeholder/Community Consultation in the current Reporting year.....	7-4
7.9.1	Stakeholder Under ISO/DIS 2600	7-4
7.9.2	Selection of stakeholder for consultation.....	7-5
7.9.3	Method of community consultation	7-5
7.9.4	Post COVID-19 Scenario under CCDP & CSR	7-6
8.	IMPLEMENTATION STATUS OF MITIGATION MEASURES IN ESMP	8-1
8.1	Existing Status of Environmental Compliance at Zorlu Wind Farm	8-1
9.	COMPLIANCE STATUS OF COMPREHENSIVE COMMUNITY DEVELOPMENT	
	PLAN (CCDP)	9-1
9.1	CCDP Priority Areas Implementation Status	9-1
9.1.1	Grievances Redressal Mechanism	9-3
10.	CONCLUSION	10-1
11.	RECOMMENDATION	11-1

LIST OF TABLES

Table 1-1: Complex Energy Yield and Power Curve 2020	1-2
Table 2-1: Conditions for Environmental Approval for Zorlu Wind Farm	2-1
Table 8-1: Existing Status of Environmental Compliance at Zorlu Wind Farm	8-2

LIST OF ANNEXURE

Annexure A	Environmental and Social Monitoring Team
Annexure B	Reports of 2020 inspection
Annexure C	Accident Report Form
Annexure D	PPEs Inspection Sheet
Annexure E	List of Local Employees at Zorlu Wind Farm (O&M Phase)
Annexure F	QHSE Policy for O&M Phase
Annexure G	Risk Assessment Sheet
Annexure H	Site Photographs
Annexure I	Pictures of Post COVID-19 Awareness Raising Campaign
Annexure J	Complex Energy Yield and Power Curve 2020
ANNEXURE K	Water Quality Report
ANNEXURE L	Vehicular Test Reports
Annexure M	Training Record Sheet
Annexure O	Training Certificates

List of Exhibit

Exhibit 3-1: Existing Mechanism of Environmental and Social Monitoring at Zorlu Wind Farm3-7

EXECUTIVE SUMMARY

Élan Valorisation (Pvt.) Ltd. is entrusted as independent monitoring consultant in order to monitor environmental and social compliance for operational phase of Zorlu Wind Farm. Zorlu O&M is the maintenance contractor of the wind farm. The Zorlu Wind Farm (56.4 MW) has been under operation since March, 2013. ESCM for O&M phase was awarded to Élan Valorisation (Pvt.) Ltd. in August, 2014.

Environmental and Social Monitoring comprises mainly i) compliance monitoring required to investigate environmental orthodoxy of the project with approved EIA and ESMP and; ii) effect monitoring required to assess the effectiveness of mitigation measures proposed in ESMP. Present report on Annual Environmental and Social Monitoring of the project has been prepared to report the compliance status in 2020 to meet requirement as recommended in ESMP. It covers environmental performance of project and social actions taken during this year.

Major activities carried out by monitoring experts during this annual monitoring visit are; meetings with project staff, monitoring of environmental and social compliance documents, physical visit/inspection of the site and stakeholder's consultation. The monitoring includes looking after of environmental compliance at control room building, switch yard area and other active operational sites such as operational wind turbines, workshop, battery/SCADA/MV rooms, dispensary, RO plant, wastes produced etc. This year IFC staff/rep has not visited the wind farm.

As far as documentation and record keeping is concerned, it is generally up to mark. Daily/weekly/Monthly DRS are being developed and are found complete. Firefighting system is operational and firefighting drills have been conducted to prepare for any unforeseen. Long outstanding issue of low pressure in eyewash of battery room has been resolved. Air quality is monitored regularly and reports are found within specified limits of Sindh Environmental Quality Standards (SEQS). Noise quality monitoring reports manifest that compliance status is satisfactory.

In first and 2nd quarters scheduled maintenance and training activities affected due to outbreak of COVID-19. However, in third quarter activities revived after COVID-19 and community awareness program in the nearby villages were carried out to help them survive in the second wave of Covid-19. Moreover, the need to deliver NEBOSH training to the concerned officials identified in the last quarter of 2020 to ensure the compliance with NEPRA safety codes and fulfill legal requirements.

Overall, status of ESMR of current year is satisfactory. Deficiencies regarding E&S performance and improvements required are enlisted in this report and have been communicated to the project developer and contractor.

1. INTRODUCTION

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

Document in hand is annual Environment and Social Monitoring Report (ESMR) of Zorlu Wind Farm of the year 2020. The report covers monitoring of environmental and social compliance at/around Zorlu Wind Farm in year 2020. Data of previous year monitoring is available in annexures. This report has been prepared for submission to International Finance Corporation (IFC).

1.1 Zorlu Wind Farm

Total premises of Zorlu Wind Farm comprises of 1,300 acres of land. It is located about 100 km southeast of Karachi near Jhimpir town in Thatta District. The site is located in a flat rocky area and is about 50m above sea level. The site is approachable by roads and rails both. Wind Farm site is accessible through M-9 Motorway (Formerly Super Highway) as well as through National Highway.

The Wind farm was developed in two phases. In 1st phase 6 MW, five German-made gearless “VENSYS 62” wind turbines each capable of producing 1.2 MW were installed/connected with 11 KV HESCO network. It started generation in April 2009. In 2nd phase, 28 more wind turbines of 1.8 MW capacity each, supplied by “Vestas” of Denmark were installed to produce a total of 50.4 MW electricity. This increased the capacity of the project to 56.4 MW. The project was completed in March 2013. The capacity enhancement of the Project was approved by Alternate Energy Development Board (AEDB). All turbines have been connected to a substation with an underground power cable system. The sub-station is connected to national grid system of HESCO/NTDC. The wind farm is operational continuously since its commissioning. Its yield for year 2020 is given in following table;

Table 1-1: Complex Energy Yield and Power Curve 2020

Net Production (MWh)2020		
Month	Achieved monthly production MWh	Wind speed m/s
Jan-20	6.66	11,488.86
Feb-20	6.37	8,546.43
Mar-20	5.7	7,683.47
Apr-20	6.32	9,062.50
May-20	8.49	17,777.96
Jun-20	8.28	16,122.69
Jul-20	7.88	14,255.50
Aug-20	7.04	12,316.53
Sep-20	5.97	6,996.73
Oct-20	5	4,609.00
Nov-20	5.58	6,257.91
Dec-20	6.12	7,644.12
Average Wind Speed & Total Production	6.6175	122,761.70

1.2 The Proponent – ZEPL

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

1.3 The Lender – IFC

Asian Development Bank (ADB) and International Finance Corporation (IFC), a member of World Bank Group, has invested with Zorlu Enerji Pakistan. Zorlu Enerji is a key IFC client in the renewable energy sector and is considered to be one of experienced members of electricity generation/distribution market of world. With presence in many countries of the world; Zorlu decided to enter in renewable energy sector of Pakistan by establishing a wind power plant at Jhimpir, district Thatta of Sindh province. Implementation of ESMP, EIA, CCDP and environmental & social compliance during O&M phase of the project is one of the mandatory requirements set

by project financing agencies ADB, IFC. Accordingly, Élan Valorisation (Pvt.) Ltd has been entrusted for assignment of monitoring the implementation of ESMP, EIA and CCDP.

1.4 The Consultant – Élan Valorisation (Pvt.) Ltd

Élan Valorisation (Pvt.) Ltd. is the sister company of Élan Partners (Pvt.) Ltd. which is dedicated for environmental and social studies as well as third party monitoring. Élan Valorisation comprises of highly experienced team of environmental and social professionals having multidimensional experience to deal with the environmental and social aspects of developmental activities in Pakistan.

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1.5 Environmental and Social Monitoring

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

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

required to implement the approved ESMP (for O&M phase), EIA, BMP and CCDP in letter and spirit.

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

This ESMR contains the outcomes of the awareness raising campaign in surrounding village of Zorlu Wind Farm regarding precautionary measures to be taken in the wake of 2nd wave of the COVID-19.

2. ENVIRONMENTAL PERMISSIONS AND COMPLIANCE CERTIFICATES

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

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

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

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

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

Conditions of Environmental Approval	Compliance Status
Project will be constructed at safe distances away from any area of environmental and social sensitivity.	Complying with this condition, Zorlu Wind Farm has been constructed at barren land away from human settlements and no such areas of environmental and social sensitivity are located near the wind farm site.
No industrial or residential activity will be allowed at wind farm site.	No such activity is being done at wind farm site.
Employment shall be provided to local skilled and unskilled people.	Zorlu Enerji has appointed 14 numbers of local people for various skilled and unskilled jobs during O & M period at wind farm. Detail of local people employment has been provided in upcoming sections of the report.
Project proponent will ensure the implementation of EIA and EMP and will report the responsible authority.	Zorlu has appointed the Élan Valorisation (Pvt.) Ltd as environmental and social monitoring consultants, to ensure the implementation of EIA and EMP. Environmental and social monitoring reports are also prepared on quarterly basis for submittal to Sindh-EPA and other relevant organizations such as International Finance Corporation (IFC) and Asian Development Bank (ADB).
Project proponent will be responsible to implement all relevant sections of Pakistan Environmental Protection Act (PEPA, 1997) and Pak-EPA EIA/IEE Regulations	All relevant sections of PEPA, 1997 and Pak-EPA regulations are being implemented at Zorlu Wind Farm. No major violations have been recorded during the reporting period.

3. FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL MONITORING

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

3.1 Components of Environmental & Social Monitoring

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

3.1.1 Site Visits by Environmental Experts

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

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

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

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

- O & M Camp;
- Grid Station;
- Control Room Building
- Fire Fighting Station;
- Staff Residence
- Wind Turbines;
- Dispensary

- 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:

3.1.2 Meeting with Project Personnel

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

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

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

This meeting was held at Zorlu Wind Farm site office on October, 16th 2020 and attended by the following

- Mr. Mushtaq Ahmed Plant Manager, Zorlu O&M Pakistan Ltd.
- Mr. Fatih Yakhtin Mechanical Supervisor
- Junaid Rafique Control System Engineer

3.1.3 Monitoring of Environmental Compliance Documents

EIA and ESMP put the need to prepare, maintain and implement the environmental compliance documents by the O & M contractors which include; Solid Waste Management Plan, 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.

The noise level of operational turbines was found from 63 dB to 71 dB at wind speed 12 m/s with overall plant production of 45 MW in December 2020 which is within the permissible NEQs limit of 85dB. Noise levels measuring annual report is given at **Annexure – B1**.

Emergency Diesel Generator (EDG) Inspection was conducted and no leakage in lubrication, cooling, induction fuel and exhaust system was found. Generator noise was in permissible range. Condition of lube oil (viscosity, colour) and fuel level observed normal. Colour of exhaust smoke was observed as normal. EDG Inspection reports third quarter is given at **Annexure – B2**.

Battery readings were recorded on 15-11-2020 for third quarter and details are provided in **Annexure –B3**.

Six-month service inspection conducted of WTG-16 on 09-11-2020 and all the systems were functioning in orderly, details attached in **Annexure – B4**.

Annually scheduled maintenance carried out on 09-11-2020 on WTG-16. All risks assessed related to O&M and found to be complied with the requirements. PPE's were also used during the Assessment. Risk Assessment Form O&M is given in **Annexure – B5**.

3.1.4 Trainings and Capacity Building

In EIA report of Zurlu Wind Power Project section- 8 (Monitoring and Follow-up Measures) it is required to train the working force to raise awareness and capacity building. To fulfil the training requirements; IOSH session in December 2016, ISO 14001:2015 Lead Auditor session in December 2017, ISO – 26000 and CSR orientation session in February 2020; have been conducted. The purpose of CSR orientation workshop was to enhance social responsibility and its integration throughout the organization, community involvement and development, Fair Operating Practices and improve organizational governance. The trainings are given to HSE manager, HSE inspector, representatives from Head office and three other staff member from O&M team, who have to act as Master trainer to impart training to all the staff working at the wind farm.

OHS (hydro project) training was conducted virtually on 29-9-2020 to 30-9-2020 due to Covid-19 from IFC. Details of the personal received the training given in **Annexure – O**.

3.1.5 Field Monitoring

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

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

- Air quality (Noise);
- Water quality;
- Soil contamination;
- Solid Waste Management ;

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

3.1.6 Findings of the environmental and social monitoring

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

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

The compliance and deficiencies in the reporting year are listed blow;

i. Compliance

- WTG 13 was visited where activity of Borescope Inspection of Gear Box was in progress.
- WTG 22 was stopped due to Controller Batteries replacement and Inspection of drive train
- Hand sanitizers are place at entrance of every room of control building and common places of the camp (pictures in the ***Annexure-H***)
- Corona SOPs are displayed at all prominent places (pictures attached in the ***Annexure-H***)
- Caution for wearing mask of displayed at every entry door.
- Rotation of staff at 50 percent in 2nd wave of COVID-19

ii. Deficiencies/Gaps

- Oxygen cylinder of dispensary found empty (pictures attached in the ***Annexure-H***)
- Ambulance back door resists while complete opening
- Date is expired at some fire extinguisher
- CSR activities remain suspended mainly because of COVID-19

- Recommendations of annual report of 2019 could not be implemented appropriately. Financial stress due to non-issuance of payment from government and restrictions due COVID-19 were the main reasons.
- Two side locks of all emergency door need to be replaced with one side locks.
- CSR activities remain suspended mainly because of Corona

3.1.7 IFC Monitoring Visit

IFC representative and staff were unable to conduct the annual visit to the wind farm in the current reporting year i.e. 2020.

The outbreak of pandemic there were flight restrictions and lockdown all over the world.

3.1.8 Emergency Response Procedure (ERP)

A comprehensive Emergency Response Procedure manual has been formulated by ZEPL. These procedures cover general emergency situations as well as crises situation related specially to wind turbines. The purpose of this manual is to develop a system which provides instructions and assigns responsibilities in case of any emergencies. ZEPL commits sources and funding necessary to develop and implement appropriate emergency preparedness programs and drills. Specific emergency response plans are maintained for ZEPL operating sites. These plans provide instructions to manage an emergency and establish roles and accountabilities for emergency response tasks. While every situation is different and one may have to take decisions under pressure. In such cases, these guidelines help to take such measures which ensure the safety of maximum people. In this quarter, the firefighting drill has been carried keeping in view this ERP.

3.1.9 Integrated Management System (IMS)

The Integrated Management System (IMS) Manual for Zorlu Wind Farm covers all the activities related to operation and execution of supervision carried out at Zorlu O&M Pakistan.

This Manual is based on the Quality, Environment, Health & Safety Assurance model that covers the requirements of three specific Standards applicable to the following areas of the Company's activities, and the Company ISO certificates are provided as **Annexure-O**.

- i. ISO 9001: 2015 – Quality Management System
- ii. ISO 14001: 2015 – Environmental System Requirements
- iii. ISO 45001: 2018 – Health and Safety Requirements

Each section of the manual contains the statements about the Company policy for each standards element.

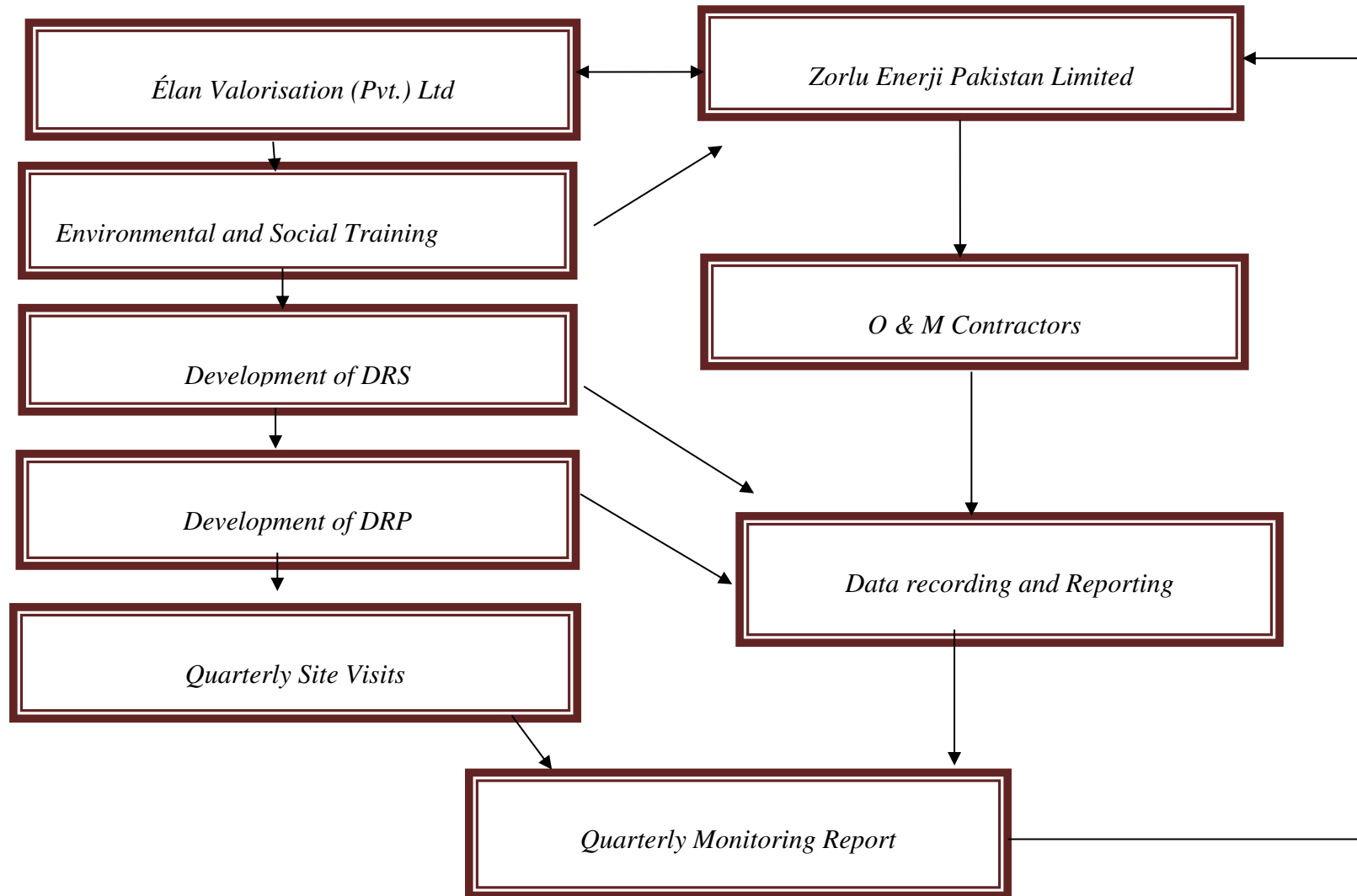
The system requirements of this manual are aimed at achieving customer satisfaction by consistently providing Quality services related to power generation through application of the system ensuring continuous improvement and the prevention of nonconformity.

3.1.10 Zorlu Energy Campsite Security Plan

Zorlu campsite features a comprehensive security plan. The plan comprises of 44 security guards including supervisors. The security plan operates in three shifts 1.e. A, B and C. Shift A and B features deployment of 14 guards whereas shift operates on 16 guards. The guards are assigned at different location around Zorlu setup like campsite, gates, Grid station and wind turbines. The guards are well equipped with arms and well trained. Out of 44 guards, 30 are local and 14 are outsiders.

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 and stakeholder/community consultation at in the current reporting year of the project operation whereas profiles of the experts have been attached at **Annexure-A**.

S. Anwar Raza	Team Leader / Chief Executive Officer
Naveed Ul Haq	Director Environment & Spatial Planning
Iqra khan	Environmentalism
Mrs. Ayesha Naveed	Environmentalism

4. ACCIDENTS RELATED TO ENVIRONMENT /SAFETY

Health and safety measures are well cared of at all project locations including O & M camp, grid station and O & M control building. Necessary health and safety equipment's have been made available to the workers at all project locations.

4.1 Accidents Related to Work Place Safety

O & M contractors have established well developed mechanism of HSE monitoring and reporting which has been discussed in upcoming section. During the reporting period, no incident of environmental and safety accident was reported. O & M contractor has established proper Safety Accident Report Forms to record and report any incident of safety accident. A sample safety accident report form is attached as **Annexure-C**.

An equipped first aid room and ambulance facility is available at O & M camp with the qualified nursing staff available for twenty four hours. First aid boxes have been maintained at various locations within the O & M control building. Various first aid items are kept in the first aid boxes. In addition to it, all first aid items and necessary medicines are also kept in dispensary.

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

5. LABOR RELATIONS – LEGAL FRAMEWORK

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

5.1 Factories Act, 1934

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

5.2 Employment of Child Act, 1991

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

5.3 IFC-Environmental, Health and Safety Guidelines 2007¹

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).

¹ 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, 14 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.

5.4 ADB's Safeguard Policy Statement 2009

The ADB's safeguard policy 2009 sets out the policy objectives scope and trigger, and principles for following three key safeguard areas:

- Environmental safeguard
- Involuntary resettlement safeguard and
- Indigenous people safeguards.

Environmental Safeguards

This policy element ensures the environmental soundness and sustainability of projects and supports the integration of environmental considerations into the project decision-making process. Environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts.

Involuntary Resettlement Safeguards

This policy guideline encourages avoiding involuntary resettlement by exploring project and design alternatives; to enhance, or at least restore, the livelihoods of all displaced person in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups.

Indigenous People Safeguards

This guides the project proponent to design and implement projects in a way that fosters full respect for indigenous peoples' identity, dignity, human rights, livelihood systems, and cultural uniqueness as defined by the indigenous peoples themselves so that they (i) receive culturally appropriate social and economic benefits, (ii) do not suffer adverse impacts as a result of projects, and (iii) can participate actively in projects that affect them.

6. CAPACITY FOR REGULAR MONITORING OF ENVIRONMENTAL AND SOCIAL ISSUES

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

O & M Phase Staff

- Environmental and Social Inspector (ESI), Project Developer;
- Environmental and Social Officer (ESO), O & M Contractor;
- Mr Shahid Ali and Mr Imtiaz Ali have been given IOSH training to perform duty of ESO and ESI respectively. They are further trained as Environmental Audit in 2017 to perform these tasks smoothly.
- Training on ISO/DIS 26000 regarding CSR was planned in the last quarter of 2019 could not be conducted in 2020 due to outbreak of COVID-19.

Roles and responsibilities of these nominated professional in accordance with ESMP are as below:

- The ESI ensures implementation of the environmental management plan in the field. He also coordinates 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 is responsible for the implementation of the ESMP during O&M phase. He is also responsible for communication with and the training of their respective O&M staff in all aspects of the ESMP;
- HSE Manager ensures the implementation of health and safety measures and approved HSE plans during O & M phase of the project.
- HSE Manager is responsible for and conducts the internal audits on Bi-annual basis.
- Twenty first aid trained workers present on turbines are responsible to initially manage the situation if any incident happens.

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



Figure 1 Organogram related to E & S Management

6.1 Environmental and Social Trainings

Plan for environmental and social trainings for O&M phase of the project has been prepared as part of EMP. Environmental and social trainings will be aimed to ensure that the requirements of the EIA and ESMP can be clearly understood and followed by all project personnel throughout the O & M period. The trainings will be provided to the Zorlu staff, the O & M contractor, and other staff engaged for the project operation and maintenance. The environmental and social training will cover all staff levels, ranging from the management and supervisory to the skilled and unskilled categories. The scope of the training will cover general environmental awareness and the requirements of the EIA and the ESMP, with special emphasis on sensitizing the project staff to the environmental and social aspects of the area. List of training conducted in the year 2020 is provided at **Annexure-E**

7. STAKEHOLDER CONSULTATION UNDER CORPORATE SOCIAL RESPONSIBILITY ACTIVITIES

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

7.1 Social Capacity Building

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

Zulfiqar Ali Brohi-Social Mobilizer

Mr. Brohi 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.

7.2 Drinking Water Supply to Local Community

Zorlu is providing drinking water from Keenjhar Lake to the local communities through mobile water tankers. Local communities includes Urs Jhakro, Allah Bux Gujjo, Abbas Mir Bahar, Ahsan Ali Palari, Khamiso shoro, Suleman Palari , Musa Utho and Latho Gaijo residing near the wind farm site. Zorlu is also trying to provide sufficient amount of drinking water by increasing the numbers of water tankers for every village to meet the community basic requirements.

Water tankers are provided in routine as below mentioned:

- Basho jakhra 2 tankers in month.
- Village Ganja 14 tankers in month
- Haji Suleman Brohi 14 tankers in month
- Capacity of tanker is 12000 litres

It is suggested that Zorlu may provide tube-well/pressure pump in village at some central location so that the residents can fetch water for drinking and other purposes. This is an important step towards the implementation of Community Development Plan.

7.3 Promotion of Education among Local Communities

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

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

7.4 Flood Relief Activities

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

7.5 Coordination with Local Welfare Organizations

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

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

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

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

7.6 Employment Opportunities for Local Community

Zorlu provides employment opportunities to the local people on priority basis. Total 14 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-E**. In a village namely Urs Jhakro employment ratio has increased upto 20%. Due to developmental activities and the investment of international companies in the area, the job opportunities are available for the local community.

7.7 Jhimpir Area Up-Gradation Program (JAUP)

Jhimpir region is known as wind corridor of Pakistan as it has immense potential of Wind Power. Many wind farms are operational in the region, several wind farms are in construction phase and LOI's are issued to numerous wind farms. As so many wind farms will be operational in the area and these wind farms are bound under CSR to invest in development of the local area. It is need of hour to revive Wind Farm Power Producer Association in true sense to make working group and common pool of resource to start productive vital intervention in the area. This working group will give course to development work in the area and will lead to true sense development in the area. These steps will be helpful in changing the fate of the area. Under this three plans are proposed Details are as under

7.7.1 Area Ecology Up-Gradation Plan (AEUP)

Keenjhar Lake, second largest wetland of Pakistan, which is an internationally recognized migratory birds' hotspot is situated at a distance of 24km eastwards. It has 13,450 ha area. Its length is 24 km and width 6km. It is important wintering area for the migratory waterfowl and several species of passerine birds, which roost for the night in the tall and thick water reeds that grow at the shallow edges of the lake. This is also a breeding area of local wetland birds. Although it is a Ramsar site and wildlife sanctuary, yet extensive commercial fishing is practiced in it. That causes considerable disturbance for migratory birds, in addition to the disturbance caused by the considerable tourism, particularly during the winters. That has caused gradual but significant decline in the number of wintering migrants.

Wind Power Producers Association (WPPA) is interested in AEUP for ecology up gradation. For this purpose both components of ecosystem i.e. biotic and abiotic will be up-graded.

7.7.2 Sweet Water Enhancement Program

As of now, the main source of water in Jhimpir is rainfall. The maximum rainfall occurs between months of July and September. Currently, there is no proper water harvesting system in the area. As a result, most of this rain water is wasted through percolating and mixing with the saline ground water. Some of this water ends up in the ocean via different water ways. The demand of sweet water is very high in area and it is need of hour to conserve this rain water so that basic water necessities of area can be fulfilled.

7.7.3 Socio-Economic Upliftment Plan

To obtain the target of socio-economic Upliftment some suppositions are made and way & means are devised. All stakeholders will be requested to present suggestions/proposal/ advise/ requirement in the workshop for achievement of targets of social Upliftment program. However comprehensive set of ways and means will be prescribed during feasibility study to achieve desired targets of social Upliftment program. Due respect will be given to stakeholders opinion while preparing the program details.

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

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

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

7.9 Stakeholder/Community Consultation in the current Reporting year

The project implementation community consultation could not be carried out due to the outbreak of COVID-19. However, awareness raising campaign under CCDP conducted, results are given below;

7.9.1 Stakeholder Under ISO/DIS 2600

Key **stakeholders** in a business organization include creditors, customers, directors, employees, government (and its agencies), owners (shareholders), suppliers, unions, and the community from which the business draws its resources

A **corporate stakeholder** can affect or be affected by the actions **of** a business as a whole. Whereas shareholders are often the party **with the** most direct and obvious interest at stake in business decisions, they are one **of** various subsets **of stakeholders**, as customers and employees also have stakes in the outcome. Following are the types of the stakeholders.

- i. Customers. Stake: Product/service quality and value
- ii. Employees. Stake: Employment income and safety
- iii. Investors. Stake: Financial returns
- iv. Suppliers and Vendors. Stake: Revenues and safety
- v. Communities. Stake: Health, safety, economic development
- vi. Governments. Stake: Taxes and GDP.

Stakeholders are responsible for reviewing the financial data of the company to ensure that the business is performing well and that they are not losing their investment. They may also be responsible for voting on allocation of certain funds.

7.9.2 Selection of stakeholder for consultation

Out of the five stakeholders enlisted at 7.9.1. NTDC/STDC which is the customer remains in touch continuously for power demand and communicate their response regarding power supply efficiency on daily basis. Employees usually communicate with their relevant manager to resolve their issues. While lenders visit periodically and send observations to the proponent which are well attended. Suppliers and vendors also remain in regular contact for the supply of items like food, stationary etc. and collection of wastes.

In nut shell, all the other stakeholders are in communication by one or other way but the community never finds the appropriate opportunity to approach and give feedback to the proponent regarding availed benefits through this project or any issue encountered. Although Grievance Redressal System (GRS) is in place but employees get benefit from this opportunity and community have never registered any grievance mostly. Therefore priority has been given to the community for formal consultation.

7.9.3 Method of community consultation

Usually common needs are addressed under corporate social responsibility. Further to it Goths are very small in size of population (varies from 10 to 15 families). Therefore, instead of Individual consultation tool of FGD is selected for common consultation. Focused group discussion carried out every year with whole population instead of selecting sample out of available statistical population size to avoid the sample bias as well as sample error. However, in the current reporting year consultation could not carried out due to COVID-19.

7.9.4 Post COVID-19 Scenario under CCDP & CSR

Questionnaires were prepared to assess community needs in post COVID-19 scenario under Comprehensive Community Development Plan (CCDP) and CSR. However, after arriving at site keeping in view the on ground situation it was decided in consultation with Zorlu field staff to conduct awareness campaign in wake of second wave of Covid-19. Therefore, community awareness was carried out in Atho Ganjo village to give them every possible information to cope up with the situation. Masks and sanitizers were also distributed among them. Pictures are added in

Annexure-I

8. IMPLEMENTATION STATUS OF MITIGATION MEASURES IN ESMP

Environmental and Social Management Plan (ESMP) was prepared to address the environmental and social requirements of O&M phase. Environmental and social compliance monitoring for O&M phase was awarded to Élan Valorisation (Pvt.) Ltd. in August, 2014. ESMP for O&M phase has been revised to update existing ESMP prepared at the time of preparation of EIA report. Formal implementation of ESMP was started during the month of August, 2014 after the environmental and social training imparted by the Élan Valorisation to the project staff and workers particularly to the people involved in the implementation of ESMP including HSE Manager of O & M contractor.

Data Record Sheets (DRS) had been developed for monitoring the compliance with ESMP as well as for effect monitoring². 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)³.

As mentioned earlier, Environmental and Social experts of Élan Valorisation visit the wind farm site on quarterly basis and quarterly environmental and social monitoring reports are prepared and submitted to the Zorlu Enerji Pakistan Limited. Quarterly monitoring reports highlight the status of environmental compliance, deficiencies and shortcomings and provide with 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. Annual report is also prepared after end of every calendar year to present cumulative picture of the year.

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, 2020) 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.

² Effect monitoring was the part of ESMP to monitor the effectiveness of mitigation measures proposed in ESMP

³ Data Record Plan has been developed in order to schedule the monitoring activities which includes the monitoring frequencies, monitoring locations and monitoring responsibilities

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

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
Air Quality	<ul style="list-style-type: none"> • In compliance with ESMP, Air Quality Monitoring Plan (AQMP), has been prepared by EPC contractor; • Air quality is monitored in accordance with the requirements set in DRS and DRP; • Water sprinkling is practiced as appropriate at locations of potential dust emissions; • Project vehicles and machinery is tuned and maintained in good working conditions. 	<ul style="list-style-type: none"> • Dust separation measures on long term basis like growth of vegetation need to be initiated in appropriate/planned manner as suggested at 7.7
Noise	<ul style="list-style-type: none"> • Noise Monitoring Plan (NMP) has also been prepared and implemented at relevant project locations; • Noise monitoring is being carried out at relevant locations. 	
Water Quality	<ul style="list-style-type: none"> • For drinking purposes, most of the time, potable mineral water purchased from some certified companies is being used at project site; • Contractor has installed commercial scale water treatment plant at construction camp which works on Reverse Osmosis (RO) technique of water purification from salts and other unwanted agents. The treated water is mainly used for bathing and washing purposes for workers/staff. Water quality of treated water is monitored on monthly basis to analyze its fitness for drinking purposes. • To ensure the proper functioning, filtration membranes of RO plant are replaced on weekly basis. • Refused water from RO plant is being stored in wastewater collection pond. 	<ul style="list-style-type: none"> • The condition of RO plant is not working at full capacity on infrastructural and operational level, • It is required to overhaul the RO plant.
Soil Contamination	<ul style="list-style-type: none"> • Oil spillage from fuel storage containers and generators may contaminate the soil. As an existing practice, polythene sheets have been spread beneath the fuel containers and generators to avoid the soil contamination from oil leakages and spills; 	<ul style="list-style-type: none"> • Polythene sheets used for collection of waste oil should be replaced regularly; • Used gear oil be reused or disposed off appropriately

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
Solid Waste Management	<ul style="list-style-type: none"> • Solid Waste Management Plan (SWMP) has been prepared and implemented at project site. • Non-hazardous waste produced per day ranges from 50-75 kg of 80 workers at camp site • Hazardous waste i.e. batteries etc., are collected by local hazardous waste collection company for disposal. • As the existing practice, solid waste is collected from all locations at wind farm and dumped at waste dump site located away from the O&M camp. • Empty water bottles and other containers are separately collected and stored for the scavengers. 	<p>Need to check the status of license of hazardous waste collection vendor. It is pertinent to mention here license is issued by concerned EPA after checking the environmental aspects of practice of the vendor for disposal of waste</p>
Waste Water	<ul style="list-style-type: none"> • Separate septic tanks for collection of grey (water from kitchen and washing and bathing) and black water (water from toilets) have been constructed at O&M camp; • Septic tanks for waste water and rain water have also been constructed at O & M control building; • Septic tanks are emptied when required. Waste water from tanks is sucked into mobile waste water tanks and released at some suitable locations with prior consent of land owners. 	<ul style="list-style-type: none"> • Need to check the status of license of waste water collection vendor. It is pertinent to mention here license is issued by concerned municipality after checking the environmental aspects of practice of the vendor for disposal of waste.
Flora, Fauna and Bird Monitoring Plan	<ul style="list-style-type: none"> • Zorlu Wind Farm is located at barren land near Jhimpir town in Thatta District, Sindh. Due to coarse and sandy soil structure, natural vegetation is scarce in the area except widely spaced shrubs and bushes. Wild bushes from small patches of land were cut to clear the land for construction activities of wind farm; • Likelihood of bird mortality has been identified in EIA report as potential negative impact of Zorlu Wind Farm. Migratory birds coming from Siberia may encounter with wind turbines during their staging at Keenjhar Lake located near the wind farm. It was recommended in the EIA report that Bird Monitoring Plan (BMP) should be prepared and implemented at wind farm; • Accordingly, BMP was developed by Élan Partners (Pvt) Ltd and approved in 2012. In compliance with the BMP, bird monitoring is being carried out at wind farm. On the basis of bird monitoring data, bird monitoring report for the reporting period is being prepared. • Further as a mitigation measure, wind turbines at Zorlu Wind Farm have colored blades to facilitate the migratory birds so that they can visualize 	<ul style="list-style-type: none"> • Compensatory plantation of native floral species or alternative arrangements should be, as the plantation of drought and salt loving grasses may be started; • Zorlu Energy should maintain close coordination with wildlife department and WWF throughout the period of project operation and maintenance. • Bird monitoring study is concluded. Data tabulation and analysis is in progress and will be made part of next annual report • It is suggested that a tree plantation drive should be carried out twice in a year in which maximum trees should be planted to improve vegetation in the area.

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
	and sense the presence of these alien structures (wind turbines) from far of distance and height.	
Workers Health and Safety	<ul style="list-style-type: none"> • Zorlu O&M has established and implemented the EHS Plan for O&M phase of the project. • Well experienced and qualified HSE Engineer has been appointed by O & M contractor to look after the matters related to workers health and safety; • Availability and use of Personal Protection Equipment's (PPEs) have been observed as common practice at Zorlu Wind Farm. However, due to habitual reasons, some workers are always reluctant to the use of PPEs; • Equipped first aid room has been maintained at O&M camp⁴. Qualified dispensers are available twenty four hours for emergency treatments and first aids. Services of doctor are also available in case of severe emergencies which is available at site on phone call. Record of first aid medicines is properly maintained with their expiry dates. First aid data is recorded on daily basis in separate register including the details such as name of patient, nature of illness, treatment/medicines provided. On the basis of first aid records, first aid report is prepared on weekly basis. First aid arrangements have also been maintained at control building and grid station. • An ambulance equipped with basic first aid facilities is available 24 hours at project site; • Proper trainings are provided to O & M staff related to firefighting, first aid, work permit including work at height, use of PPEs, risk assessment and other health and safety measures. Training records are properly maintained on specific training record sheets which is provided at Annexure-E; • Risk assessment sheets are also developed for risk analysis. A sample risk assessment sheet is provided at Annexure-G. • 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; 	<ul style="list-style-type: none"> • Trainings related to health and safety matters should be provided to the workers/employees on regular basis during the operational phase of the project; • Moreover there should be compulsory induction training for every new worker covering all necessary information such as; introduction to work environment; introduction to possible work place hazards; self-protection and escape measures etc.; • All the trainings should be arranged keeping in view the literacy level and language of the workers/employees; • Design and use of PPEs should be such that it is compatible with harsh weather conditions in order to minimize the ergonomic hazards which are related to the working conditions at site. • Safety drills should also be conducted on regular basis. • Training workshop on CSR should be conducted in year 2021.

⁴ Formerly used as construction camp during construction phase of the project.

Environmental and Social Parameter	Compliance Status	Shortcomings and Recommendations
	<ul style="list-style-type: none"> Material Safety Data Sheets (MSDS) have been made available for all chemicals and hazardous material used during the O&M works of wind farm. O & M contractor has established an Emergency Response Procedures (ERP) to address the protection of life, health, safety, environment and property during emergencies at control building. ERP for control building. O & M contractor has also established and implemented EHS Regulations for Zorlu wind farm. These EHS regulations address the health and safety measures for operators and technicians during its entirety after performing any work in wind turbines. 	
Community safety and security	<ul style="list-style-type: none"> No human population exists within the close vicinity of the wind farm site. Proper safety measures need to be adopted during the project O&M phase to ensure community safety and security due to the operation of wind turbines and electricity generation. Therefore as the safety measures during O & M phase, all wind turbines have properly fenced and gated to avoid any unauthorized entry into the arena of wind turbine. Moreover security towers have also been established all around the wind farm to look after the farm for twenty four hours. 	
CO ₂ emissions by the project	<ul style="list-style-type: none"> Wind energy is considered as green energy all over the world with no atmospheric emissions. However during the O&M phase of the project, small scale air emissions can happen due to vehicular and machinery exhausts and use of fossil fuels in power generators. These emissions are less significant at Zorlu wind farm as mitigation measures including maintenance of vehicles and generators are strictly adopted. Therefore CO₂ emission has least contribution to atmospheric emissions. 	<ul style="list-style-type: none"> All vehicles and generators should be tuned regularly.
Workers Camps	<ul style="list-style-type: none"> In the construction period of the project camps were establish to accommodate the workers. These camps are still being utilized by 80 workers currently living in the operational phase of the project. The camps are now unfit for the workers to continue living and do not fulfill the IFC workers' accommodation requirement's. Annexure - H 	<ul style="list-style-type: none"> Appropriate accommodation should be establishing on priority as per IFC workers' accommodation guidelines.

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

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

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

9.1 CCDP Priority Areas Implementation Status

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

9.1.1. Water and Sanitation

Zorlu is providing drinking water with water tankers. The company can provide tube-well in the future terms and also, water treatment and desalination plant where required may be installed to provide safe drinking water to the community.

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 hygienic practices and developing the sanitation system on self-help basis.

9.1.2. Health

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

This area is also un-attended due to the same problem of communication with local communities as stated earlier. It can also be implemented in coordination with some local NGO. It is suggested that support may be provided to Lady Health Worker (LHW) networks. However Zorlu provides transportation/ambulance facility in case of emergency situations to the villagers. New initiative of medical camps was started in 2018 which has turned into a good service to the community in very short period of time.

9.1.3. Education

As stated in CCDP, the literacy rate in the vicinity area is very low because most of the schools in project area don't have skilled teachers. Zorlu is working on its behalf to improve this situation. In this regard distribution of educational material where necessary and vocational training for persons aging between 15-35 can improve the situation.

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.

Transportation service provided is sufficient. However, if any need arises from the community from time to time then it can be seen on a case basis in the future. 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.

9.1.1 Grievances Redressal Mechanism

ZEPL has developed and implemented a grievance redressal mechanism to resolve the complaints in an effective and timely manner. According to stakeholder engagement plan ZEPL is committed to ensure security and privacy of community. There is a grievance redressal mechanism through which any complaint or demand by local community can be addressed and compensated. A complaint register is maintained at camp site in which all complaints are recorded. The person responsible for the record keeping also conveys the complaints to the higher authorities to resolve the issues. Following are the complaints received in the year 2020 which are in progress.

Table 9-1: Grievances from Local People & Respective Corrective Actions by ZEPL

S. No	Grievance	By whom	Reco by Client	Corrective action
1.	Hiring of Teacher for school	People of Village Ladho Ganjo	Application has been sent to higher management	In progress
2.	Supply of water tank thrice in a month	People of Village Urs Jhakro	Application has been sent to higher management	In progress
3.	Demand of Solar Plate	People of Village Suleman Brohi	Application has been sent to higher management	In progress

10. CONCLUSION

- i. Conclusion drawn about environmental performance after monitoring of Zorlu Wind Farm is given below in annotated form;
- ii. Outbreak of COVID-19 overshadowed the performance and progress as activities remained restricted due to the lockdown in the country.
- iii. Overall status of environmental and social compliance at Zorlu wind farm is satisfactory during the reporting period (January 1, 2020 to December 31, 2020)
- iv. ZEPL has made considerable arrangements related to environmental and social aspects of the project.
- v. ZEPL is well conscious of the environmental and social considerations and relevant laws/regulation.
- vi. Keeping in view the findings of bird monitoring at site, bird monitoring has been discontinued with the conclusion that bird mortality in the wind form has remained zero during the monitoring period of 5.5 years. The firefighting system is operational after completion of maintenance work. This is also a step toward environmental compliance.
- vii. Heavy rainfall resulted in growth of lush green grasses and shrubs which solved the issue of dust in the area. Grasses and shrubs are also grown. Animal grazing is also observed during the site visit.
- viii. Paramedical training has been imparted to medical dispenser which is a good step toward improvement of medical facility at the camp site.

11. RECOMMENDATION

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

1. Containers for residence at the camp site are no safer for inhabitation due to extremely deteriorated condition.
2. It is recommended to deliver NEBOSH training to at least two concerned personnel of the plant to ensure the compliance with NEPRA safety codes and fulfill legal requirements.
3. Firefighting drill should be conducted on bi-annual basis.
4. Indoor natural plants need to be looked after and improved in number and variety on regular basis.
5. In house trainings to staff regarding environment, health and safety need to be imparted on regular basis.
6. Vegetation (Grasses/shrubs/plants/trees/herbs) must be grown to improve the horticulture in the plant area.
7. Need to improve work on CSR activities.
8. Agricultural development programs may be initiated 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
9. Zorlu is ready to proceed coordinately with neighboring Wind farms for water, education, agriculture matters. In this regard, it is recommended that IFC should bring other clients on same platform so that CSR activities in the area can be carried out in coordinated and efficient manner.

Annexure A
Environmental and Social Monitoring Team

Naveed ul Haq

Dr. Naveed ul Haq is a senior Urban Planner and Environmental Expert. He is currently working as Director Environment and Spatial Planning in Élan Partners. He is Ph.D. Scholar in Environmental Friendly Urban Planning from Islamic International University. He is IOSH, ISO - 26000 and CSR and Lead Environmental Audit Qualified. He is life time member of Pakistan Council of Architects & Town Planners (PCATP), and Member of International Society of City & Regional Planners (ISOCARP). He graduated in City and Regional Planning from University of Engineering and Technology, Lahore in 2000. He completed his Master's Degree in City and Regional Planning from the same university in 2004. Apart from this, he did BA in Economics and Sociology in 1997 and MA in Economics in 2000 from Punjab University, Lahore. After working for 16 years with corporate as well as Government sector, Dr. Naveed ul Haq joined Élan Partners in 2016. Till now, during his stay in Élan, he has successfully completed numerous projects whose nature vary from spatial planning, environmental management to public private partnership.

Ayesha Naveed

Mrs. Ayesha Naveed is highly motivated and goal driven environmentalist coupling relevant practical experience of more than 7 years with master's degree in environmental sciences. She is PhD scholar. She has proven work experience in field of environment as she has been a part of team working on resilience aspect in environmental sustainability study in 25 districts of KPK and has also conducted various EIAs and IEEs. She has broad understanding and has produced research papers on climate change and other such global environmental issues. She has written at least five research papers addressing EIA, climate change, global warming and city resilience. Main emphasis of these research articles was EIA practices in Pakistan and its relationship to sustainability and contribution of mega projects to climate change which ultimately affects the environmental resilience. She has discussed the climate with perspective of water issue particularly river flow and achieving millennium development goals (MDGs). Environmental resource consumption in relationship to population growth, city resilience and climate change is her special topic of interest and area of expertise. She has also participated on various forums to give her valuable input including training on "Adopting Sustainable Consumption and Production (SCP) to Pakistan Context by UNEP, Switchasia, EU.

Iqra khan

Ms. Iqra Khan is working as Assistant Manager Environment at Élan Partners (Pvt.) Ltd. She graduated from International Islamic University, Islamabad (IIUI) in Environmental Science. She is a M.Phil. scholar in Environmental Science from IIUI. She is associated in various projects i.e. Hydropower, Wind Power, Thermal, LT waste to energy etc. in undertaking wide range of activities i.e. field visits, socioeconomic surveys for data collection and monitoring. Ms. Iqra significantly contributed in

numerous IEE/EIA reports and presentations for EPA public hearings and other government departments

List of Professionals indirectly involved in Project:

S. No.	Name	Specialization	Position in the Project
1.	S Anwar Raza	Chief Executive Officer	Chief of Party
2.	Muhammad Huzaifa	System/Web Administrator	Report Formatting

Annexure B1
Noise Monitoring Form

ZORLUENERJI


NOISE MONITORING FORM

ZOROM-WPP-MS-F-42

Issue Date: 01/05/2015
Revision: 01

Project name:	WF ZORLU, Pakistan	Average wind speed (m/s)	2.12			
Location:	Pakistan, Jhampir WF ZORLU	Plant Production: (MW)	45			
Date:	11.12.2020	Wind Direction:	East	West	North	South
Theme:	Noise Readings for operational turbines		EW	WN	NS	SE
			SW	ES	EN	

Measuring instrument	
Manufacturer:	TECMAN (TM810 M)
Type:	Digital Sound level Meter (TM810 M)

Coordinates	Date	Time	WTG_ID	Distance from Location	Value [dB]	Observations	Name & Signature:
25° 2'16.07" N 68° 03' 29" E		8:10	WTG#01	5 METER	71		
25° 2'30.09"N 67°59'34.82"E		8:15	WTG#06	5 METER	72		
25° 2'59.30"N 67°59'4.70E		8:20	WTG#10	5 METER	64		
25° 3'46.58"N 67°57'59.89E		8:25	WTG#16	5 METER	67		
25° 2'50.19"N 67°59'46.27"E		8:35	WTG#17	5 METER	68		
25° 2'24.91"N 67°58'54.67E		8:45	WTG#22	5 METER	64		
25° 3'5.85"N 67°59'54.11"E		8:50	WTG#24	5 METER	71		
25° 3'33.08"N 67°59'9.63"E		8:55	WTG#28	5 METER	69		
25° 4'8.44"N 67°58'11.87"E		9:20	WTG#33	5 METER	67		
25° 3'17.96"N 67°59'4.83"E		8:00	Control Building	Reference From (WTG#21)	70		
25° 2'45.49"N 67°59'57.70"E		8:00	Camp Area	Reference From (WTG#05)	63		

Annexure B2
EDG Inspection Report

EMERGENCY DIESEL GENERATOR (EDG) INSPECTION FORM

WORKING DATE	28 th November 2020
LOCATION:	Zorlu Grid Station
INSPECTION CONDUCTED BY	Jalil Ahmed & M. Ramzan
LAST INSPECTION DATE	27 th December 2020

Note: Put off Main EDG Breaker Before doing inspection.

EMERGENCY DIESEL GENERATOR			
Activities	Ok	Not OK	Actions Taken
Condition of lube oil (viscosity, color etc)	✓		Level Ok
Check Coolant Water Level	✓		found ok
Check Fuel level	✓		60%
Check any leakage in Lubrication, Cooling, induction fuel system.	✓		
Remove Water from fuel Filters.	✓		
Check and clean the Air Filter.	✓		
Battery Check	✓		
Exhaust duct insulation and joints	✓		
Now run the Diesel engine for 15 Min on no load/Load	✓		
Visualize the Abnormal Noise/Leakage in Lubrication, Cooling, Induction, fuel & Exhaust System.	✓		
Check Colour of Exhaust Smoke			Normal
Warning light/Alarm lights	✓		
Check Parameters from Controller			Found Ok
Cleaning of Generator			Cleaning done

PREPARED BY	CONTROL BY	APPROVED BY
JALIL AHMED MUGHAL	SHAHID ALI/ FATİH MEHMET NOHUT	OKTAY ERTUĞRUL/SECKIN DEMIR/MUSHTAQ AHMED

Annexure B3

Battery Readings

ENERJI		WEEKLY CONTROLS 110 VOLT SYSTEM BATTERIES		Form no:ZOM-WPP-MS-F-41 Rev.no : Rev.00 Date: 23-1-2016	
Manufacturer : Faure-x EXIDE		Bank No. 2			
Type : 1XMP 19 2V150H AT 10 HR, Lead acid		Inspection Date :			
Capacity : 150 Ah.		Total Votage: 112.22			
Quantity : 55		Ambient temperature: 22			
Float charging voltage : 2.23V / Cell		Date : 15/11/2020			
Electrolyte Type : Sulphuric Acid (H ₂ SO ₄)					
Electrolyte Densitiy : 1.24 ± 0.01 gr/cm ³					
Electrolyte level : Max. - Min. Line					
Discharge Current : 1.80 V/ Cell, 10 h, 15 A					

BATTERY NO	VOLTAGE 2.23 Volt	DENSITY 1.24 gr/cm ³	TEMP: 10-35 C°	DESCRIPTION	BATTERY NO	VOLTAGE 2.23 Volt	DENSITY 1.24 gr/cm ³	TEMP: 10-35 C°	DESCRIPTION
1	2.20	1.24	22		31	2.21	1.22	22	
2	2.20	1.23	22		32	2.20	1.24	22	
3	2.20	1.24	22		33	2.10	1.23	22	
4	2.10	1.23	22		34	2.20	1.24	22	
5	2.20	1.24	22		35	2.20	1.24	22	
6	2.20	1.24	22		36	2.10	1.23	22	
7	2.10	1.23	22		37	2.20	1.22	22	
8	2.20	1.23	22		38	2.20	1.22	22	
9	2.00	1.23	22		39	2.30	1.23	22	
10	2.20	1.24	22		40	2.20	1.24	22	
11	2.20	1.23	22		39	2.20	1.23	22	
12	2.20	1.24	22		42	2.20	1.24	22	
13	2.10	1.23	22		43	2.20	1.23	22	
14	2.20	1.24	22		44	2.21	1.24	22	
15	2.20	1.24	22		45	2.21	1.24	22	
16	2.10	1.23	22		46	2.22	1.24	22	
17	2.20	1.23	22		47	2.20	1.23	22	
18	2.00	1.23	22		48	2.00	1.22	22	
19	2.20	1.23	22		49	2.20	1.22	22	
20	2.20	1.24	22		50	2.30	1.23	22	
21	2.10	1.23	22		51	2.20	1.24	22	
22	2.20	1.24	22		52	2.20	1.23	22	
23	2.20	1.24	22		53	2.20	1.24	22	
24	2.20	1.23	22		54	2.20	1.23	22	
25	2.20	1.24	22		55	2.21	1.23	22	
26	2.10	1.23	22						
27	2.20	1.24	22						
28	2.20	1.23	22						
29	2.20	1.23	22						
30	2.20	1.24	22						

- NOT 1. This maintenance and checks must be done, written and saved every week on Sundays, between 08:30 to 17:30 by electrical maintenance team.
2. Use only distilled water and electrolyte to complete the level.
3. Do not use wire brush or any solvent for cleaning.
4. In case of any abnormal decrease in cell voltages or electrolyte levels and overheating in cells, immediately inform the authorized staff.

Annexure B4
Six Month Service Inspection form
WTG16

7TH YEARLY –SERVICE INSPECTION FORM 2020

Turbine Type: V90-1.8 MW Mk 7.1	Turbine Number:	Date: 09-11-2020.
Pending Works	INTG-16	
Engineer / Technician Names:		
1. <u>Mutahiz Ahmed</u>	4. <u>Nadeem Hishri</u>	
2. <u>Masroor Saleem</u>	5. _____	
3. <u>Alif Zia</u>	6. _____	
Tasks List	Done	Remarks/Persons
1 - Nose Cone		
1.1 - Check nose cone support for damage. Tightness	<input checked="" type="checkbox"/>	Found Loose tightened <i>MS</i>
1.2 Checking and inspection of LCTU (Lighting current transformer unit Replace if less than 10 mm	<input checked="" type="checkbox"/>	Replaced new ones. <i>MS</i>
2-HUB and Blade Bearing		
2.1 Clean blades grounding sliding plates	<input checked="" type="checkbox"/>	Done- <i>MS</i>
2.2-Checking tightness of grease collector and hoses Replace if damaged	<input checked="" type="checkbox"/>	Done <i>MS</i>
2.3-Hub console tightening and hose inspection of Hydraulic system	<input checked="" type="checkbox"/>	Done found little loose <i>MS</i>
2.4-Checking torque of stiffness plate of blades	<input checked="" type="checkbox"/>	Done accordingly <i>MS</i>
2.5-Check for loose connection in locking blade collar.	<input checked="" type="checkbox"/>	Found ok. <i>MS</i>
3 -Main Shaft Arrangement		
3.1 - Check the main bearings for noise and vibrations.	<input checked="" type="checkbox"/>	<i>MS</i>
3.2 - Check leakage at a seal at main bearing.	<input checked="" type="checkbox"/>	Not found <i>MS</i>
3.3 - Lubricate main bearings. During lubrication, keep 500 rpm. After lubrication, increase speed to 1000 rpm until grease stop coming out from the hole. ● Front bearing SKF LGWM1 (149139)(1200 g) ● Rear bearing SKF LGWM1 (149139) (1200 g)	<input checked="" type="checkbox"/>	Done accordingly. <i>MS</i>
3.4 Collect the grease sample of main bearing.	<input checked="" type="checkbox"/>	Taken properly. <i>MS</i>
4 - Torque Arm System		

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4.1 - Check two (2) M33 bolts in torque arm/gear connection on each side. (50 mm socket with HYTORC machine)	<input checked="" type="checkbox"/>	Machine not available.
4.2 - Check torque arms for cracks.	<input checked="" type="checkbox"/>	" "
4.3 Check all four (4) M64 studs in each side of the bearing housing, Two (2) in front and two (2) in rear end, eight (8) bolts in all. 960501 'Bolt Connections'. Check all four (4) M52 bolts in front part of the main bearing housing, two (2) in each side of bearing housing, four (4) bolts in all. Check and tighten the bolts of the three inductive sensors	<input checked="" type="checkbox"/>	" "
4.4 Dampers visually check	<input checked="" type="checkbox"/>	Found normal.
5.0 Composite coupling		
5.1 Visually inspection of brake pads	<input checked="" type="checkbox"/>	Found under size
5.2-Check the caliper ,	<input checked="" type="checkbox"/>	Found OK
5.3-Inspection of composite coupling and its joints	<input checked="" type="checkbox"/>	Found OK.
5.4-Replace brake pads if found undersize	<input checked="" type="checkbox"/>	Replaced all new ones.
5.5- Composite coupling 17mm bolts, cleaning with wire brush and zinc because they are getting corrosion.	<input checked="" type="checkbox"/>	Done accordingly.
6. Gear Box		
6.1- Extract an oil sample. See 959406.	<input checked="" type="checkbox"/>	?
6.2-Check air filter element, change if contaminated.	<input checked="" type="checkbox"/>	Replaced
6.3-Replace filter element and clean the filter housing.	<input checked="" type="checkbox"/>	Done.
6.4 Replace offline filter if contaminated.	<input checked="" type="checkbox"/>	Not - available.
6.5 Check and Replace A/B inline filters if contaminated	<input checked="" type="checkbox"/>	Replaced new ones.
7 - Gear Oil System		
7.1 - Check oil level (at standstill). Also note down temperature at level check.	<input checked="" type="checkbox"/>	Found at Level
7.2 - Check all over for oil leakage.	<input checked="" type="checkbox"/>	Not - found any serious leakage.
7.3 - Check the gear oil magnetic dipstick for debris.	<input checked="" type="checkbox"/>	Found normal.

ZORLUENERJI

7.4 - Check the magnet plugs for debris.	<input type="checkbox"/>		
7.5 - Check contamination switch /chip detector S457 (Pos. 30)	<input checked="" type="checkbox"/>	Not-found any.	Other
7.7 - Check air filter element, change if contaminated.	<input checked="" type="checkbox"/>	Replaced.	M
7.8 - Check leakages and tightness of gear box openings	<input checked="" type="checkbox"/>	found ok.	M
7.9- Gear box opening flanges gaskets replacement.	<input checked="" type="checkbox"/>	found ok.	M
7.10 Replace offline filter if contaminated.	<input checked="" type="checkbox"/>	not- available.	
7.11 Check and Replace A/B inline filters if contaminated	<input checked="" type="checkbox"/>	Replaced.	Other
8 -Generator			
8.1 - Check for noise in bearings.	<input checked="" type="checkbox"/>	NDR- Side heard sound at up to 200-RPM.	
8.2 - Lubricate front/rear generator bearings. Klüberplex BEM 41-132 (149190). Reservoir must be 2/3 full. If already full, don't add grease. Note: if automatic lubricator is installed, check that it is adjusted correctly	<input checked="" type="checkbox"/>	Done accordingly.	ACW
8.3 - Check grease return pipe.	<input checked="" type="checkbox"/>	Done ok.	ACW
8.4 - Check lubricator tightness.	<input checked="" type="checkbox"/>	Done. ok.	ACW
8.5 - Check of suction fan and filter for PSRS.	<input checked="" type="checkbox"/>	Done found ok.	ACW
8.6 - Check that exhaust hose is correctly fitted.	<input checked="" type="checkbox"/>	found ok.	ACW
8.7-Checking ground brushes and measure all sizes Replace if less than 50mm	<input checked="" type="checkbox"/>	Replaced new ones.	ACW
8.8- Checking Power brushes , sizes and cleaning Replace if length less than 30 mm	<input checked="" type="checkbox"/>	found in size 55- to 72.	ACW
8.9-Checking slip ring unit Replace if groves less than 1 mm	<input checked="" type="checkbox"/>	found ok.	ACW
8.10- Zinc and Cleaning of Generator foundation base bolt.	<input checked="" type="checkbox"/>	and phase plan.	
8.11-Slip ring to blower install the air hose duct if damage	<input checked="" type="checkbox"/>	found ok.	ACW
9 - Cooler Top			

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9.1 - Top up the coolant if level low.	<input checked="" type="checkbox"/>	Topped up.	Atth
9.2 - Check cooler cover assembly for any loose or missing bolts.	<input checked="" type="checkbox"/>	Done accordingly.	Atth
9.3- Top cooler cleaning with water jet pump	<input checked="" type="checkbox"/>	Done accordingly.	Atth
9.4. Check accessible machine bolts in support studs and brackets. Check cooler cover assembly for any loose or missing bolts	<input checked="" type="checkbox"/>	Done.	Atth
10 - Hydraulics			
10.2 - Check for leakage in main shaft.	<input checked="" type="checkbox"/>	Found normal.	Atth
10.3 - Check for leakage in hub.	<input checked="" type="checkbox"/>	Done.	Atth
10.4 - Pre-charge pressure in emergency pitch accumulators. 85 +0/-5 bar at 20°C. Check for gas leakage. Measured value: New value after adjustment, if any:	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	not available in stock. A _____ B _____ C _____ bar A _____ B _____ C _____ bar	
10.5 Pre-charge Main accumulator		Before _____ bar After adjust _____ bar	
11 - Yaw Bearing System			
11.1 Refill Yaw grease reservoir if found empty	<input checked="" type="checkbox"/>	Not in stock. found at half level.	M
11.2- Visually inspection of Vibration switch	<input checked="" type="checkbox"/>	Found ok.	ACZ
11.3- Cleaning the yaw grease plat form and paint	<input checked="" type="checkbox"/>	plan in 2nd phase.	
12 Yaw Gear Motor			
12.1 Check oil level and refill if necessary:	<input checked="" type="checkbox"/>	Found at Level	
12.2 Check oil level in planetary gear.	<input type="checkbox"/>	/	
12.3 Check oil level in worm gear.	<input type="checkbox"/>	/	
12.4-Check M16 bolts for radial slide plates for end-stop (brass or aluminum piece)	<input checked="" type="checkbox"/>	Found ok.	M
12.5-Check/adjust the spring packages	<input checked="" type="checkbox"/>	Done accordingly	ACZ
12.6-Lubricate via the two tubes in the sliding plates	<input checked="" type="checkbox"/>	Done	ACZ
12.7-Lubricate the sliding surface of the yaw top with a Very thin layer of grease.	<input checked="" type="checkbox"/>	Done.	Atth

13-Controller filters			
13.1 Top control cabinet filter clean/replace	<input checked="" type="checkbox"/>	Replaced & cleaned	AC✓
13.2 Cabinet B small filter clean/Replace	<input checked="" type="checkbox"/>	with Blower-	AC✓
13.3 UPS down ground filters clean	<input checked="" type="checkbox"/>	Done	AC✓
13.4 Dehumidifier filters replace/Clean	<input checked="" type="checkbox"/>	Done.	AC✓
14-Nacelle Cover			
14.1-Check bolts, fittings, and nacelle cover.	✓	found ok	Shz
14.2-Check anchor points.	✓	found ok.	Shz
15-Ultrasonic FT-Wind Sensor			
15.1-Check that the sensor is properly tightened.	✓	one ok. Two found Errors.	With
15.2-Check FT status on controller	✓	Done	With
16-HV Transformer and Transformer Room			
16.1-Clean the transformer room	✓	Done accordingly.	With
16.2-Test arc detection system	✓	found ok.	With
16.3-Tight the PT sensors	✓	found ok.	With
16.4-Clean the cables terminals	✓	Done accordingly.	With
16.5-Replace the exhaust pipe if found damage	✓	found ok.	MT
17- End of Inspection Procedure			
17.1 - Check for oil waste, loose bolts, and such like.	<input checked="" type="checkbox"/>	Done.	Shz
17.2 - Start-up. Leave SERVICE mode, set turbine into PRODUCTION mode.	<input checked="" type="checkbox"/>	Done	Shz
17.3- Elevator inspection and tightness work	<input checked="" type="checkbox"/>	2nd phase plan.	-
17.4- Blade outside surface inspection via Binocular device.	<input checked="" type="checkbox"/>	Not in Stock.	-
17.5 -Blade collar Tightening	<input checked="" type="checkbox"/>	Done accordingly.	M
18-Functional test of turbine			
18.1- Emergency test	<input checked="" type="checkbox"/>	found ok.	AC✓
18.2-FT sensor Select Pic:11.64 "FT SENSOR"	<input checked="" type="checkbox"/>	One Error. one ok.	M

18.5-Position transmitter voltage test (Positive Pitch End-Stop) Select picture:11.8	<input type="checkbox"/>	
18.6-Test All processor Back-up Batteries	<input checked="" type="checkbox"/>	NAC & HVB- found Error. <i>dh</i>

ADDITIONAL ACTIVITIES

1. High torque check from top to bottom (Tower, Nacelle and Hub) 25% after wind gust	—
2. Blades studs tension check 25% after wind gust	—
3. Apply the stickers on the turbine	—
4. Stiffness plat (220 Nm)	Done
5. Cable tie the hydraulic hose pipe and control cable from Nacelle to hub	Done
6. Tightening of lasing belt to first aid box	Found ok, <i>dh</i>
7. Fix the fire blanket by cable	Found ok <i>dh</i>
8. Prepare the medicine packages and put first aid in box.	—
9. Applying the pictorial label of load on the nacelle body.	—
10. Paste the stickers on the entrance door inside locking knob.	—
11. Replace the FT sensor rubber cover if found damage	Found ok. <i>dh</i>
12. Apply the zinc spray to the rusting parts of the equipment	—
13. Complete cleaning of the trafo and install the air duct	→ Done <i>mt</i>
14. Complete cleaning of the nacelle farm top to bottom	—
15. Apply the Rain guard covers to turbines	Found ok <i>dh</i>
16. Fix the tray for RMU	—
17. Cleaning all grease/oil spots from turbine	—
18. Elevator platform and other platforms bolt tightening.	—
19. All seepage point bigger buckets replacements	—
20. Blade checker plates 13mm bolts replacements	Found ok. <i>m</i>
21. Ladder cleaning	—
22. Pitch cylinder paint/spray with blue color on dents or marks	—
23. Yaw gear area and rubber seal clean	—


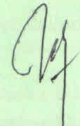
Annexure B5
Annually scheduled maintenance
WTG16

ZORLUENERJI ZORLU PAKISTAN WIND FARM
WORK AUTHORISATION FORM

WORK ON TURBINE NUMBER: _____ WORK / ERROR CODE & TEXT: _____ DETAILED WORK DESCRIPTION: <u>07th Yearly Schedule Maintenance</u>	DATE:- <u>09-11-2020</u> WTG - <u>16</u>
WORK START DATE: <u>09/11/2020</u> TIME: : <u>10:36</u> WORK COMPLETION DATE: <u>09/11/2020</u> TIME: : <u>16:14</u>	
<u>TEAM LEADER:</u> NAME & DESIGN: <u>Shahid Ali</u> COMPANY: <u>Zorlu O&M</u> 	<u>PERSONEL LIST TO WORK:</u> 1) <u>Nadeem</u> 2) <u>Muhammad</u> 3) <u>Masood</u> 4) <u>Alif Zia</u> 5) _____
Note: All electrical and mechanical isolation of relevant WTG(s) as per the VESTAS Guidelines have been confirmed by myself and authorized Zorlu O&M staff has been informed about all operation and safety rules of the work by myself.	
<u>SIGNATURE:</u>	
<u>WORK AUTHORISATION IS GIVEN BY</u> Name: <u>Muhammad Ramzan</u> Designation: <u>CRO</u> Signature:	<u>WORK AUTHORISATION IS CANCELED BY</u> Name: <u>Muhammad Ramzan</u> Designation: <u>CRO</u> Signature:
Note: performed by Zorlu O&M Technicians against to error code and all operation and relevant safety rules have been explained to myself in the treated turbine by the end of troubleshoot.	
<u>PLANT SAFETY AND SECURITY INSTRUCTIONS</u>	
Site security conditions must be confirmed from the authorized O&M person (any of Plant Manager, Section Head, and Control Room Operator) prior to work. Before start of the job WORK AUTHORISATION FORM should be filled and submitted to the control room operator. Work should be started after complete isolation of the WTG(s) which are planned to be worked on as per VESTAS Guidelines (both Electrically and Mechanically) After completion of the work, this work authorization form must be signed and canceled by both parties. Only authorized O&M person (any of Plant Manager, Section Head, and Control Room Operator) is entitled to give permission for the work at site being subject to contractual terms of the Service and Availability Agreement dated 23 February 2011.	
<u>WORK AUTHORISATION REQUIREMENT</u>	
Related equipments Education/Training Certificates (Current) Detailed Work Description as referred above. Tools, protective equipments and spare part list and calibration certificates which will be used during the work.	

WTG # 16

Date - 09-11-2020

DEFINITION OF RISK		
<input checked="" type="checkbox"/> Working height	<input checked="" type="checkbox"/> Crash	<input type="checkbox"/> Springing particules
<input checked="" type="checkbox"/> Electric	<input checked="" type="checkbox"/> Tripping	<input checked="" type="checkbox"/> Noise
<input checked="" type="checkbox"/> Falling objects	<input checked="" type="checkbox"/> Confined space	<input type="checkbox"/> Poison
<input checked="" type="checkbox"/> Lifting operation	<input type="checkbox"/> Heat stress	<input checked="" type="checkbox"/> High Oil pressure
<input checked="" type="checkbox"/> Excavation works	<input checked="" type="checkbox"/> Rotary machine	
<input type="checkbox"/> Other	<input type="checkbox"/> Fire	
PRECAUTION		
PROPER PPE		
<input checked="" type="checkbox"/> Helmet	<input checked="" type="checkbox"/> Slider	<input type="checkbox"/> Safety glasses
<input checked="" type="checkbox"/> Harness	<input checked="" type="checkbox"/> Glove	<input checked="" type="checkbox"/> Shock absorber
<input checked="" type="checkbox"/> Mask	<input type="checkbox"/> Ear plug	<input checked="" type="checkbox"/> Safety boot
<input type="checkbox"/> Others		
Prepared by		Approved by
		

Annexure C
Accident Report Form

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

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

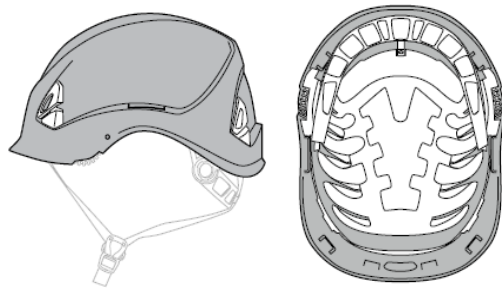
Annexure D
PPEs Inspection Sheet

**ZORLU O&M PAKISTAN WIND FARM
FALL PROTECTION (LADDER AND RAIL) CONTROL FORM**

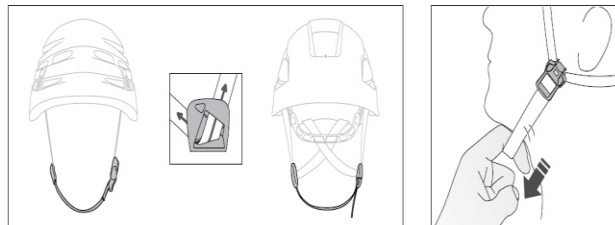
DOC: ZOM_PAK_F4.09.Rev01

This control form prepared for HELMET (PETZL) visual and functional performing test according to the manufacturer's instructions and HSE regulations.

Control Positions



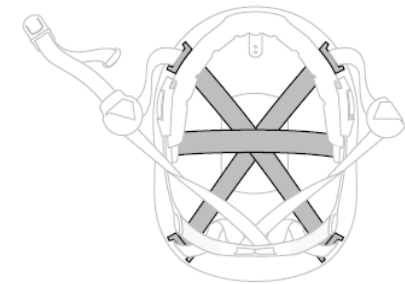
Checking the shell



Checking the chin strap



Checking the adjustment system



Checking the liner



Checking the headband

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

[illegible]

[illegible]

5. Control results

Helmet is safe for use

☐☐☐☐☐☐☐☐

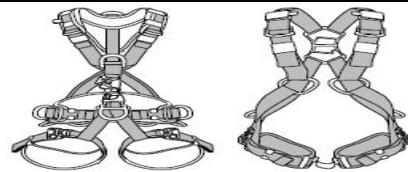
Inspection Date:

Next Inspection Date:

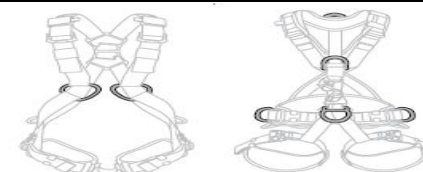
If the HELMET use is prohibited, mark the as faulty or damage.

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

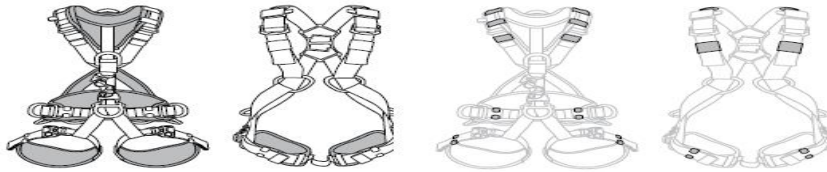
Control Positions



Checking the condition of the straps



Checking the attachment points



Checking the condition of the comfort parts

Checking the condition of the adjustment buckles



Checking the condition of the chest/seat harness connector

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

[illegible]

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

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

S.NO	NAME	DESIGNATION	Monthly Salary
1	Liaqat Ali	Store Incharge	25,400.00
2	Shah Nawaz	First Aid Clinc	21,600.00
3	Abdul Rehman	RO Plant Operator	18,600.00
4	Jamaluddin Brohi	Plumber/Welder	19,000.00
5	Baber Ali	Record Keeper	52,183.33
6	Ejaz Ali	Store Helper	18,600.00
7	Abdul Latif	Helper	18,700.00
8	Nooridin	Helper	19,000.00
9	Ghulam Mustafa	Helper	19,000.00
10	Muhammad Azeem	Helper	18,600.00
11	Muhammad Soomar	Gardener	19,000.00
12	Meboob Ali	Tea boy	19,000.00
13	Imran Ali	Workshop helper	
14	Ashoke kumar	Cleaner	18,700.00

Annexure F

QHSE Policy for O&M Phase

Approved By:



QHSE Policy

We are committed to achieve consistent level of satisfaction to our stakeholders, contractor and customer through continual improvement in the quality of our services.

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

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

We shall achieve QHSE aims by:

- Ensuring that our customers are satisfied and to advice on appropriate use of green energy.
- Providing a frame work for establishing and reviewing QHSE objectives.
- Developing and implementing management Structure and procedures at all workplaces.
- Monitoring, Evaluating & continually improving QHSE performance through assessment, trainings and audit.
- Recognizing that QHSE is directly everyone responsibility.
- Making top Management, Sr. Engineers and Technicians responsible for QHSE Management System implementation & improvement.
- Promoting healthy and safe working environment through prevention of injuries and work-related illnesses

- Continuously minimize resource consumption and measure environmental impact
- Fully abiding by applicable legislative requirements related to QHSE.
- Communicating QHSE Policy to all stakeholders.
- Training and encouraging behavior that upholds the Policy.

Annexure G

Risk Assessment Sheet

RISK ASSESMENT

Work permit number:

Date :

DEFINITION OF RISK

- | | | |
|--|---|---|
| <input type="checkbox"/> Working height | <input type="checkbox"/> Crash | <input type="checkbox"/> Springing particules |
| <input type="checkbox"/> Electric | <input type="checkbox"/> Tripping | <input type="checkbox"/> Noise |
| <input type="checkbox"/> Falling objects | <input type="checkbox"/> Confined space | <input type="checkbox"/> Poison |
| <input type="checkbox"/> Lifting operation | <input type="checkbox"/> Heat stress | <input type="checkbox"/> High Oil pressure |
| <input type="checkbox"/> Excavation works | <input type="checkbox"/> Rotary machine | |
| <input type="checkbox"/> Other | <input type="checkbox"/> Fire | |

Precaution**Proper PPE**

- | | | |
|----------------------------------|-----------------------------------|---|
| <input type="checkbox"/> Helmet | <input type="checkbox"/> Slider | <input type="checkbox"/> Safety glasses |
| <input type="checkbox"/> Harness | <input type="checkbox"/> Glove | <input type="checkbox"/> Shock absorber |
| <input type="checkbox"/> Mask | <input type="checkbox"/> Ear plug | <input type="checkbox"/> Safety boot |
| <input type="checkbox"/> Others | | |

Prepared by

Approved by

Annexure H

Site Photographs



Fig H -1: Before Inspection Meeting



Fig H-2: After Briefing Meeting



Fig H -3: Panel Room



Fig H -4: SCADA Room

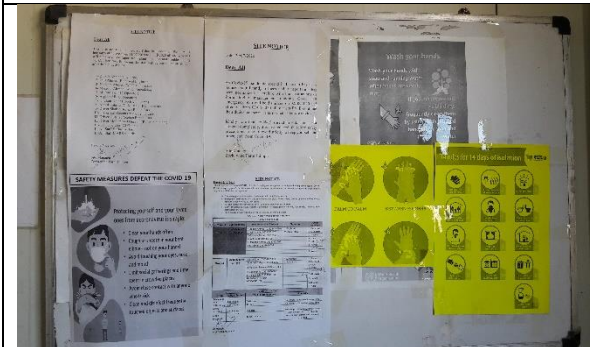


Fig H -5: Corona SOPs Displayed



Fig H -6: Sanitizers in Control Room



Fig H -10: Inspection of fully equipped Ambulance



Fig H -9: Control Room



Fig H -12: Firefighting Station



Fig H -13: Fire fighting Cylinders

Fig H-14: Internal view of Camps



Fig H-15: External View of Camps



Annexure I
Post COVID-19 Awareness Raising Campaign at
Village Atho Ganjo



I-1: Masks Distributed among the community



I-2: Briefing on COVID-19

ANNEXURE J
Complex Energy Yield and Power Curve-2020

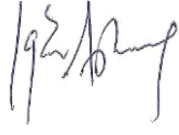

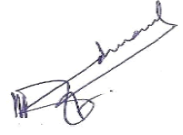
Net Production (MWh)2020		
Month	Achieved monthly production MWh	Wind speed m/s
Jan-20	6.66	11,488.86
Feb-20	6.37	8,546.43
Mar-20	5.7	7,683.47
Apr-20	6.32	9,062.50
May-20	8.49	17,777.96
Jun-20	8.28	16,122.69
Jul-20	7.88	14,255.50
Aug-20	7.04	12,316.53
Sep-20	5.97	6,996.73
Oct-20	5	4,609.00
Nov-20	5.58	6,257.91
Dec-20	6.12	7,644.12
Average Wind Speed & Total Production	6.6175	122,761.70

ANNEXURE K
Water Quality Report

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	ZORLU O & M PAK LIMITED	Manager	Iqbal Ashraf
Address	Noorabad-Jhimpir Link Road, Near Hesco Grid Station Jhimpir.	Laboratory	Chemical & Environmental Laboratory
Contact	Syed Zain Shah	Address	H-3/3, Sector 5, Korangi Industrial Area
Telephone	+92 300 2505256	Telephone	Karachi 74900. UAN: +92 21-35121388-97
Facsimile		Fax	+92-21-35121329
Email	zain.shah@zorlu.com	Email	Karachi.environment@sgs.com
Project		SGS Reference	KH20-02715
Order n°	EHS-LAB-10107/20(EHS-Q-1268/19)	Received	21/01/2020
Matrix/samples	Water(1)	Analysis Started	06/02/2020
		Analysis Completed	07/02/2020
		Approved	07/02/2020
		Date Reported	07/02/2020
		Report n°	KH20-02715 R0

SIGNATORIES

		
Iqbal Ashraf Deputy Manager Laboratory	Zeeshan Ali Deputy Manager Laboratory	Adnan Siddiqui Deputy Manager QA/QC

COMMENTS

The lab is accredited in accordance with ISO 17025 with accreditation number LAB 023.

This report is not valid for any negotiation. The remaining portion of the sample(s) will be disposed after one week unless otherwise instructed (Condition Apply).
Uncertainty of measurement can be provided upon request.



RESULTS

		Sample n°	KH20-02715.001	
		Sample Name	sample # 01	
		Sample Matrix	Water	
Parameter	Units	RL	Result	
[APHA 4500 H+ B 22nd Edition]				
pH @ 25 C	pH	0.1	7.03	
[APHA 2540 C 22nd Edition]				
Total Dissolved Solids	mg/L	5	5100.00	
[APHA 2320 B 22nd Edition]				
• Carbonate	mg/L	5	<5.00	
• Bicarbonate	mg/L	5	637.80	
Total Alkalinity as CaCO3	mg/L	5	522.78	
[APHA 3120 B 22nd Edition]				
Total Iron (Fe+2 + Fe+3)	mg/L	0.005	<0.005	
Manganese, Mn	mg/L	0.005	<0.005	
• Boron, B	mg/L	0.005	0.97	
• Lithium, Li	mg/L	0.005	0.12	
[APHA 3111 B 22nd Edition]				
Calcium, Ca	mg/L	0.02	260.50	
Magnesium, Mg	mg/L	0.02	270.50	
• Potassium, K	mg/L	0.2	14.50	
• Sodium, Na	mg/L	1	1332.50	
[APHA 4500 F C 22nd Edition]				
• Fluoride by ISE	mg/L	0.05	0.15	
[APHA 4500 NO3 B 22nd Edition]				
• Nitrate Nitrogen, NO3 as N	mg/L	0.003	<0.003	
[APHA 4500 CL B 22nd Edition]				
Chloride	mg/L	5	2265.26	
[APHA 2340 A,B 22nd Edition]				
Total Hardness	mg/L	0.05	1764.39	
[APHA 2510 B 22nd Edition]				
• Conductivity	US/CM	0.01	7320.00	
[APHA 4500 SO4 C 22nd Edition]				
Sulphate (SO4 ²⁻)	mg/L	5	519.72	
[APHA 4500 NH3 B, C 22nd Edition]				
• Ammonia	mg/L	1	1.24	
[APHA 4500 P B+C 22nd Edition]				
• Total Phosphorous	mg/L	0.05	<0.05	
[Calculated]				
• Sodium Absorption Ratio (SAR)	-	-	13.8	
[Calculated]				
• Residual Sodium carbonate	meq/L	-	-29.53	

**LEGEND****FOOTNOTES**

^	Performed by external SGS laboratory.	IS	Insufficient sample for analysis.
^^	Performed by outside laboratory.	LNR	Sample listed, but not received.
RL	Reporting Limit	NA	The sample was not analysed for this analyte
↑	Raised Limit of Reporting	NVL	Result to be validated
↓	Lowered Limit of Reporting	TBA	Parameter not yet analysed

ACCREDITATION NOTES

- * This analysis is not covered by the scope of accreditation.

This Report is issued by the Company under SGS General Conditions of Services (copy available upon request). The issuance of contracting parties from exercising all their rights and discharging all their liabilities under their agreed contract. Stipulations to the Company.

The Company's responsibility under this Report is limited to proven negligence and will in no case be more than ten times the amount of the fees or commission. Except by special arrangement, samples, if drawn, will not be retained by the Company for more than one month.

The results contained in the following report refer only to the sample tested.

This Report or a copy thereof will be retained by the Company for a period of 10 years.

Comparison of the results with the respective limits, when present, does not take into account the uncertainty of the estimated extent.

Any results out of range are marked in red.

The recovery where provided, is to be understood comprised within the specific acceptability limits.

Unless otherwise stated the result is to be understood not corrected for recovery obtained.

This report must not be reproduced, except in full.

--- End of the analytical report ---

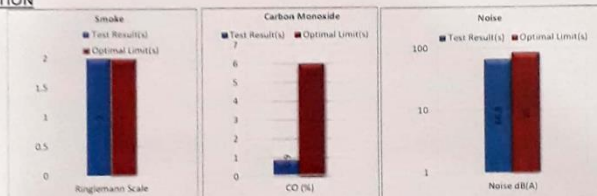
ANNEXURE L
Vehicular Test Reports

VEHICULAR EMISSION TEST REPORT

Ref. No. AMT/ZC/DEC-19/ENV-0244/JR-0526	Report No. AMT/ZC/DEC-19/VE/AL-01932
Client Name Zorlu Enerji Pakistan Ltd.	
Client Address Jimpir Nooriabad	
Contact Person Mr. Junaid Rafique	Sampling Date 21-Dec-19
Sample Description Vehicle Emission Test	Reporting Date 24-Dec-19
VEHICLE DETAILS	
Name Toyota Vio ilux	Make Toyota Hilux
Model 2016	Registration No. KU-6336
Engine No. 2KDU867072	Fuel type Diesel

S.No	Parameter(s)	Unit(s)	Methodology	Test Result(s)	Optimal Limit(s)
1	Smoke	Ringlemann Scale	ASTM D-2156	2	2
2	Carbon Monoxide	CO (%)	ASTM D-6522	0.9	6
3	Noise	Noise dB(A)	ASTM E-1124	66.8	85

Abbreviations: NA= Not Available, ND= Not Detected, BDL= Below Detectable Limit
GRAPHICAL ILLUSTRATION



* For Smoke: 01 Ringlemann Scale = 20 %.

Note: Optimal limits are given as per NEQS/SEQS (National/Sindh Environmental Quality Standards) Pakistan.


Expert Opinion: will be given only on special request.

Remark: All results are under optimal limits.





Sample Analysed by
(Field Analyst)



Reviewed by
Incharge (Environmental Laboratory)

Repudiation: This report is not valid for any judicial use and free from all claims. All test results and report is valid for the time of sampling (as per mentioned date) and particular sample (as per descriptions given by client). Maximum possible safety measure are applied, but Aims Tec (pvt) Ltd. doesn't undertake any liability for the scope of methodology used, accuracy and validity of results, which may influence by any unavoidable factors. In case of any query, must contact within a week from the reporting date. After one week of work execution your query will not be entertained.

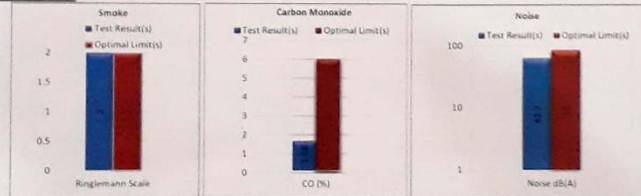
VEHICULAR EMISSION TEST REPORT

Ref. No. AMT/ZC/DEC-19/ENV-0244/JR-0526	Report No. AMT/ZC/DEC-19/VE/AL-01933
Client Name Zorlu Enerji Pakistan Ltd.	
Client Address Jimpir Nooriabad	
Contact Person Mr. Junaid Rafique	Sampling Date 21-Dec-19
Sample Description Vehicle Emission Test	Reporting Date 24-Dec-19
VEHICLE DETAILS	
Name Ambulance	Make Toyota
Model 2018	Registration No. JF-9290
Engine No. 2TR-8660230	Fuel type Diesel

S.No	Parameter(s)	Unit(s)	Methodology	Test Result(s)	Optimal Limit(s)
1	Smoke	Ringlemann Scale	ASTM D-2156	2	2
2	Carbon Monoxide	CO (%)	ASTM D-6522	1.68	6
3	Noise	Noise dB(A)	ASTM E-1124	63.7	85

Abbreviations: NA= Not Available, ND= Not Detected, BDL= Below Detectable Limit

GRAPHICAL ILLUSTRATION




* For Smoke: 01 Ringlemann Scale = 20 %

Note: Optimal limits are given as per NEQS/SEQS (National/Sindh Environmental Quality Standards) Pakistan.

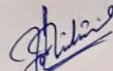
Expert Opinion: will be given only on special request.

Remark: All results are under optimal limits.



Sample Analysed by
(Field Analyst)





Reviewed by
Incharge (Environmental Laboratory)

Repudiation: This report is not valid for any judicial use and free from all claims. All test results and report is valid for the time of sampling (as per mentioned date) and particular sample (as per descriptions given by client). Maximum possible safety measure are applied but Aims Tec (pvt) Ltd. doesn't undertake any liability for the scope of methodology used, accuracy and validity of results, which may influence by any unavoidable factors. In case of any query, must contact within a week from the reporting date. After one week of work execution your query will not be entertained.



Postal Address: Plot No. B-56 / I Sector 6-H, Mehran Town, Korangi Industrial Area Karachi-74900.
Cell: +92 321-9221123
URL: www.aimstec.com.pk E-mail: info@aimstec.com.pk / operation.aimstec@gmail.com

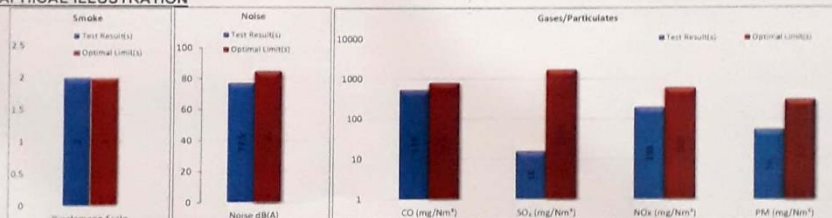
GASEOUS EMISSION TEST REPORT

Ref. No. AMT/ZC/DEC-19/ENV-0244/JR-0526	Report No. AMT/ZC/DEC-19/GE/AL-01928
Client Name Zorlu Enerji Pakistan Ltd.	
Client Address Jimpir Noonabad	
Contact Person Mr. Junaid Rafique	Sampling Date 21-Dec-19
Sample Description Gaseous Emission Test	Sampling Date 24-Dec-19
EQUIPMENT DETAILS	
Name Generator (Aksa)	Fuel type Diesel

S.No	Parameter(s)	Unit(s)	Methodology	Test Result(s)	Optimal Limit(s)
1	Smoke	Ringlemann Scale	ASTM D-2156	2	2
2	Carbon Monoxide	CO (mg/Nm ³)	ASTM D-6522	538	800
3	Sulphur Dioxide	SO ₂ (mg/Nm ³)	ASTM D-6522	16	1700
4	Oxides of Nitrogen	NOx (mg/Nm ³)	ASTM D-6522	196	600
5	Particulate Matter	PM (mg/Nm ³)	ASTM D-3685	56	300
6	Noise (at 7.5m distance)	Noise dB(A)	ASTM E-1124	77.5	85

/ Abbreviations: NA= Not Available, ND= Not Detected, BDL= Below Detectable Limit

GRAPHICAL ILLUSTRATION



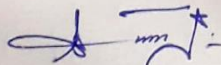
* For Smoke, 01 Ringlemann Scale = 20 %.

Note: Optimal limits are given as per NEQS/SEQS (National/Sindh Environmental Quality Standards) Pakistan.

Expert Opinion: will be given only on special request.

Remark: All results are under optimal limits.




 Sample Analysed by
 (Field Analyst)


 Reviewed by
 Incharge (Environmental Laboratory)

Repudiation: This report is not valid for any judicial use and free from all claims. All test results and report is valid for the time of sampling (as per mentioned date) and particular sample (as per descriptions given by client). Maximum possible safety measure are applied but Aims Tec (pvt) Ltd. doesn't undertake any liability for the scope of methodology used, accuracy and validity of results, which may influence by any unavoidable factors. In case of any query, must contact within a week from the reporting date. After one week of work execution your query will not be entertained.

Page 1 of 1



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 Cell: +92 321-9221123
 URL: www.aimstec.com.pk E-mail: info@aimstec.com.pk / operation.aimstec@gmail.com

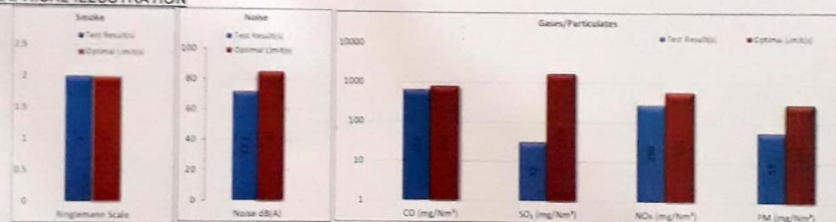
GASEOUS EMISSION TEST REPORT

Ref. No. AMT/ZC/DEC-19/ENV-0244/JR-0526	Report No. AMT/ZC/DEC-19/GE/AL-01929
Client Name Zorlu Energy Pakistan Ltd.	
Client Address Jinnah Nooriabad	
Contact Person Mr. Juhaid Rafique	Sampling Date 21-Dec-19
Sample Description Gaseous Emission Test	Reporting Date 24-Dec-19
EQUIPMENT DETAILS	
Name Generator	Make Nippon Sharfyo
Model NEA-1814	Serial No NES 220 (09)
Capacity 250 KVA	Fuel type Diesel

S.No	Parameter(s)	Unit(s)	Methodology	Test Result(s)	Optimal Limit(s)
1	Smoke	Ringlemann Scale	ASTM D-2156	2	2
2	Carbon Monoxide	CO (mg/Nm ³)	ASTM D-6522	650	800
3	Sulphur Dioxide	SO ₂ (mg/Nm ³)	ASTM D-6522	32	1700
4	Oxides of Nitrogen	NOx (mg/Nm ³)	ASTM D-6522	290	600
5	Particulate Matter	PM (mg/Nm ³)	ASTM D-3685	59	300
6	Noise (at 7.5m distance)	Noise dB(A)	ASTM E-1124	72.1	85

Abbreviations: NA= Not Available, ND= Not Detected, BDL= Below Detectable Limit

GRAPHICAL ILLUSTRATION



* For Smoke: 01 Ringlemann Scale = 20 %.

Note: Optimal limits are given as per NEQS/SEQS (National/Sindh Environmental Quality Standards) Pakistan.

Expert Opinion: will be given only on special request.

Remark: All results are under optimal limits.



Sample Analysed by
(Field Analyst)

Reviewed by
Incharge (Environmental Laboratory)

Repudiation: This report is not valid for any judicial use and free from all claims. All test results and report is valid for the time of sampling (as per mentioned date) and particular sample (as per descriptions given by client). Maximum possible safety measure are applied but Aims Tec Pvt) Ltd. doesn't undertake any liability for the scope of methodology used, accuracy and validity of results, which may influence by any unavoidable factors. In case of any query, must contact within a week from the reporting date. After one week of work execution your query will not be entertained.



Postal Address: Plot No. B-56 / I Sector 6-H, Mehran Town, Korangi Industrial Area Karachi-74900.

Cell: +92 321-9221123

URL: www.aimstec.com.pk E-mail: info@aimstec.com.pk / operation.aimstec@gmail.com

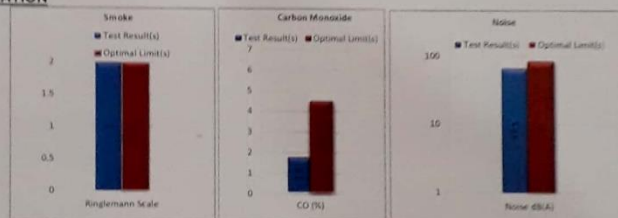
VEHICULAR EMISSION TEST REPORT

Ref. No. AMT/ZC/DEC-19/ENV-0244/JR-0526	Report No. AMT/ZC/DEC-19/VE/AL-01930
Client Name Zorlu Enerji Pakistan Ltd	
Client Address Jampur Noonabad	
Contact Person Mr. Junaid Rafique	Sampling Date 21-Dec-19
Sample Description Vehicle Emission Test	Reporting Date 24-Dec-19
VEHICLE DETAILS	
Name Toyota	Make SUZUKI
Model 2019	Registration No. KY-4217
Engine No. PKT354724	Fuel type Diesel

S.No	Parameter(s)	Unit(s)	Methodology	Test Result(s)	Optimal Limit(s)
1	Smoke	Ringlemann Scale	ASTM D-2156	2	2
2	Carbon Monoxide	CO (%)	ASTM D-6522	1.8	4.5
3	Noise	Noise dB(A)	ASTM E-1124	67.1	85

Abbreviations: NA= Not Available, ND= Not Detected, BDL= Below Detectable Limit

GRAPHICAL ILLUSTRATION



* For Smoke: 01 Ringlemann Scale = 20 %

Note: Optimal limits are given as per NEQS/SEQS (National/Sindh Environmental Quality Standards) Pakistan.

Expert Opinion: will be given only on special request.

Remark: All results are under optimal limits.



[Signature]

Sample Analysed by
(Field Analyst)

[Signature]

Incharge (Environmental Laboratory)

Repudiation: This report is not valid for any judicial use and free from all claims. All test results and report is valid for the time of sampling (as per mentioned date) and particular sample (as per descriptions given by client). Maximum possible safety measure are applied but Aims Tec (pvt) Ltd. doesn't undertake any liability for the scope of methodology used, accuracy and validity of results, which may influence by any unavoidable factors. In case of any query, must contact within a week from the reporting date. After one week of work execution your query will not be entertained.

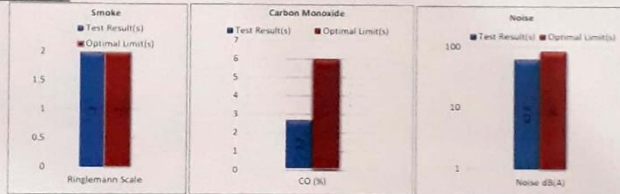
VEHICULAR EMISSION TEST REPORT

Ref. No. AMT/ZC/DEC-19/ENV-0244/JR-0526	Report No. AMT/ZC/DEC-19/VE/AL-01931
Client Name Zorlu Enerji Pakistan Ltd.	
Client Address Jimpir Nooriabad	
Contact Person Mr. Junaid Rafique	Sampling Date 21-Dec-19
Sample Description Vehicle Emission Test	Reporting Date 24-Dec-19
VEHICLE DETAILS	
Name Toyota Revo	Make Toyota Hilux Revo
Model 2019	Registration No. KV-4490
Engine No. PKT357807	Fuel type Diesel

S.No	Parameter(s)	Unit(s)	Methodology	Test Result(s)	Optimal Limit(s)
1	Smoke	Ringlemann Scale	ASTM D-2156	2	2
2	Carbon Monoxide	CO (%)	ASTM D-6522	2.7	6
3	Noise	Noise dB(A)	ASTM E-1124	62.6	85

Abbreviations: NA= Not Available, ND= Not Detected, BDL= Below Detectable Limit

GRAPHICAL ILLUSTRATION



* For Smoke: 01 Ringlemann Scale = 20 %.

Note: Optimal limits are given as per NEQS/SEQS (National/Sindh Environmental Quality Standards) Pakistan.

Expert Opinion: will be given only on special request.

Remark: All results are under optimal limits.



 Sample Analysed by
 (Field Analyst)


 Reviewed by
 Incharge (Environmental Laboratory)

Repudiation: This report is not valid for any judicial use and free from all claims. All test results and report is valid for the time of sampling (as per mentioned date) and particular sample (as per descriptions given by client). Maximum possible safety measure are applied but Aims Tec (pvt) Ltd. doesn't undertake any liability for the scope of methodology used, accuracy and validity of results, which may influence by any unavoidable factors. In case of any query, must contact within a week from the reporting date. After one week of work execution your query will not be entertained.

Annexure M
Training Record Sheet

Training Record Sheet – 2020

S.NO	TRAINING DESCRIPTION	CATEGORY	LOCATION	COMPANY/TRAINER	ESTIMATED TIME (Hr)	ESTIMATED DATE	REMARKS
1	Ware house & Material handling	TECHNICAL	ZORLU WIND FARM JHIMPIR	ZOROM	2	26-Feb-20	Done
2	CSR Training	HSE	ZORLU WIND FARM JHIMPIR	ZOROM	15	19-Feb-20 to 21-Feb-20	Done

Annexure N

Training Certificates



This is a certificate awarded to

Shahid Ali

on successfully completing

Managing Safely

a course approved and validated by the

Institution of Occupational Safety and Health

in association with

Wanco Services

Signed on behalf of IOSH

A handwritten signature in blue ink, reading "David Messenger".

Chief Executive

A handwritten signature in blue ink, reading "JAM".

Course Organiser



Date: 18 December 2016

Possession of this certificate does not confer exemption from accredited qualifications which lead to membership of IOSH.

Cert No.: 514216

TRAINING CERTIFICATE



SCHOOL OF MANAGEMENT

Awarded To

JUNAID RAFIQUE

For attending Three Days Training Course on

CORPORATE SOCIAL RESPONSIBILITY

&

INTRODUCTION TO ISO 26000:2010



Dated: 19-21 February 2020

Course Number: SOM202002-C002

Certificate Number: SOM2002C002-04

with Partnership of



www.sdc.com.pk



www.imab.org.uk

Director

This certificate is valid for (3) Three Years. you can verify its traceability at www.som.edu.pk or email us at info@som.edu.pk.

COURSE TITLE: 0 HS (Hydro Project)
Virtual Training

DURATION: 3:00 PM to 5:30 PM

CONDUCTED ON: 22.08.2020

TUTOR NAME: Mr. Naeem (IFC)



DEPARTMENT (S): ZORLU of IM Pakistan.

[illegible]

Remarks:

Tutor Signature: _____

Training RecordCOURSE TITLE: OHIS (Wind, Hydro, Solar) Project DURATION: 3:00 PM to 5:30 PMCONDUCTED ON: 30.09.2020 TUTOR NAME: Mr. Naam (JFC)DEPARTMENT (S): Zorlu CFM Pakistan.

S. No.	Name of Participant	Initial
01	Mushafy Ahmed	
02	Shahid Ali	

Remarks:

Tutor Signature: _____

COURSE TITLE: Operation of wind plants DURATION: 11:00 AM to 1:30 PM

CONDUCTED ON: 06-10-2020 TUTOR NAME: Naem (IFC)

DEPARTMENT (S): ZORLU OĞLU Pakistan

[illegible]

Remarks:

Tutor Signature: _____

Annexure O
Company ISO Certificates

CERTIFICATE



**for the management system according
to ISO 9001:2015 and ISO 14001:2015
and ISO 45001:2018**

The proof of the conforming application with the regulation was
furnished and in accordance with certification procedure it is certified for
the company

ZORLU ENERJİ ELEKTRİK ÜRETİM A.Ş

**Büyükdere Cad. No:199 Levent
Şişli – İstanbul / Turkey**

Scope:

**Production and Sales of Electricity and Steam.General contracting
services for the investment, design and construction of all kinds
of domestic and international construction projects**

Certificate Registration No.: TIC 15 100 179852
TIC 15 104 171490
TIC 15 118 20290

Valid until: 2023-05-01
Valid from: 2020-05-02

Audit Report No.: 3330 2UY3 D0

This certification was conducted in accordance with the TIC auditing and certification procedures and
is subject to regular surveillance audits.


TÜV Thüringen e.V.
Certification body for
systems and personnel



Jena, 2020-12-01



Original certificates
are branded with a hologram.

The current validity can be demanded at our homepage www.tuev-thueringen.de

Zertifizierungsstelle des TÜV Thüringen e.V. • Ernst-Ruska-Ring 6 • D-07745 Jena • ☎ +49 3641 399740 • ✉ zertifizierung@tuev-thueringen.de

CERTIFICATE



for the management system according
to ISO 9001:2015 and ISO 14001:2015
and ISO 45001:2018

The proof of the conforming application with the regulation was
furnished and in accordance with certification procedure it is certified for
the company

**ZORLU O&M ENERJİ TESİSLERİ İŞLETME VE
BAKIM HİZMLERİ A.Ş.**

**Levent 199, Büyükdere Cad. No:199
34394 Şişli- İstanbul / Turkey**

with branches (see enclosure)

Scope:

**Operation and maintenance services of
electricity generation power plants**

Certificate Registration No.: TIC 15 100 179868
TIC 15 104 171495
TIC 15 118 20320

Valid until: 2023-04-24
Valid from: 2020-04-25

Audit Report No.: 3330 2UY8 D0

This certification was conducted in accordance with the TIC auditing and certification procedures and
is subject to regular surveillance audits.

TÜV Thüringen e.V.
Certification body for
systems and personnel



Jena, 2020-12-16



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