

**TENDER FOR AERIAL SCANNING AND INSPECTION FOR
132/275KV TRANSMISSION LINE TOWERS**

TENDER REF. NO.: 210103ASI/15

PART I – TENDER PROCEDURES

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SECTION 1 – INTRODUCTION

This Introduction should be read in conjunction with Tender Appendix A [*Scope of Works / Specifications*] set out in Part II, Section 2 of the Tender Documents.

I. INTRODUCTION

This tender is called to carry out the aerial scanning and inspection for the Sarawak Energy Berhad transmission line towers in Sarawak state of Malaysia. The tender is divided into three (3) offers as follow. The final award can be a combination or parts thereof of the scope of works.

Offer (A) - Aerial scanning using Infrared (IR), Corona (UV), Visual inspection of power line

Offer (B) - Aerial scanning using LiDAR mount on same flight used by IR & UV (OPTIONAL)

Offer (C) - Aerial scanning using LiDAR and Visual Inspection of powerline using separate flight from above (All items below are OPTIONAL)

The overhead 132/275kV transmission lines are of double 3 phase live line supported mainly by lattice towers/pylons.

Offer (A) - Aerial scanning using Infrared (IR), Corona (UV), Visual inspection of power line

The single flight scanning and inspection shall include:

- I. IR scanning of transmission lines
- II. Day-time corona scanning of transmission lines
- III. Visual inspection of transmission lines
 - a. High resolution photography of all transmission towers (wide angle and detail views consisting of overview of tower, 2 nos. of upper steel structure and 1 no. lower portion together with wide view of foundation and slopes) and 3 numbers per span photography of corridors (approx. 1 photo every 50m span length)
 - b. Video recording of transmission lines and easement

Offer (B) - Aerial scanning using LiDAR mount on same flight used by IR & UV (OPTIONAL)

- I. LiDAR
 - a. Forward looking video recording
 - b. Laser scanning of transmission lines and corridor in width of 50m
- II. GIS/GMS

Offer (C) - Aerial scanning using LiDAR and Visual Inspection of powerline using separate flight from above (All items below are OPTIONAL)

- I. LiDAR
 - a. Forward Video recording
 - b. Laser scanning of transmission lines and corridor in width of 120m
- II. GIS/GMS

The identified transmission line sections and routes for the aerial scanning and inspection are listed as following. Tender rates for each item must include all incidental and contingent expenses.

Section	Route	Tower Nos.	No. of towers
Batang Ai – Engkilili – Kuching	Batang Ai – Engkilili Engkilili – Lachau Lachau – Entingan	1 – 68 1 – 132 1 – 271	471
Engkilili – Kemantan	Engkilili – Kemantan Kemantan – Song Song – Kapit	1 – 315 1 – 479 1 – 103	897
Kemantan – Selangau	Kemantan – Oya Oya – Selangau	1 – 120 1 – 155	275
Selangau – Bintulu	Selangau – Kemena Kemena – Bintulu	1 – 324 1 – 47	371
Bintulu – Miri	Bintulu – Similajau Similajau – Miri (Tudan) Similajau – Murum Junction Murum Junction – Bakun Murum – Murum Junction	1 – 127 1 – 449 1 – 248 1 – 57 1 – 147	1028

II. SCOPE OF WORKS / SPECIFICATIONS

The works in this contract comprises for:

1. Single flight aerial scanning and inspection for IR, UV, and Visual (Offer A);
2. LiDAR using same helicopter flight as in Item 1 (Offer B), and
3. Additional and separate flight aerial scanning and inspection, using LiDAR and visual of transmission line and towers including ground control survey (Offer C); and as described in the Summary of Tender and/or Specification and any other documents which may be issued from time to time during the course of the contract.

Description of Service

Offer (A) - Aerial scanning using Infrared (IR), Corona (UV), Visual inspection of power line

The scanning and inspection for 132/275kV transmission line towers including substations using but not limited to: -

- a) Radiometric IR Camera for Resistance Based Defects Scanning Inspection
 - i. To detect abnormal hotspots (e.g. Bad splices, Bad joints, Connections, Loops & Fittings, etc.) for resistant-based defects of extra high voltage (EHV) transmission overhead lines and towers in order to alert and enable engineers to avoid critical component failures resulting in outages and enable managers to prioritise faults and work patterns. Tenderer is to outline in tender the strategy to be adopted to ensure that the IR capture is optimised especially when the tower is exposed to hot sunny or windy conditions.
 - ii. Radiometric IR image data (wide view and 5 degree zoom) will be recorded when abnormal hotspots are detected. Video clip shall be included.
 - iii. High resolution photo images of structure (wide view of structure and detail views); and detail and close up view of actual fault shall be provided.
 - iv. An image snapshot from the IR Video will be taken for non-problematic tower for reporting purposes.
- b) Corona UV CBM Scanning Inspection
 - i. To detect abnormal partial electrical discharges – Corona, Tracking & Arcing (e.g. Isolator crack, Salt decomposition, Faulty composite, Pollution, Corrosion & Faulty Material etc.) for insulation based defects of EHV transmission overhead lines.
 - ii. Corona UV image data will be recorded if a large quantity of corona effect appears. Helicopter will approach the point and hover, reduced sensitivity of UV filter so as to capture the source of the corona effect. Video clip shall be included.
 - iii. High resolution photo images of structure (wide view of structure and detail views); and detail and close up view of actual fault shall be provided.
 - iv. An image snapshot from the Corona UV Video will be taken for non-problematic towers for reporting purposes.
- c) Visual inspection comprising of High Resolution Digital images and High Definition video images to detect possible “physical defects” of the structures and components of EHV transmission overhead lines and towers such as broken/damaged insulating elements, damaged/curved dischargers, damaged rods / construction, missing bolts, screws,

damaged ground cable clamps/clips, broken grounding cable, damaged warning plates, pylon ID plates, climbing vegetations on pylon, foundation slip failures and erosion; and also to get an overview of the corridor for ROW and vegetation management.

- i. High-Resolution Digital Images for Visual Survey Inspection (Tower Structures, Components & Base) with Tower ID:
 - a. Minimum 5 high-resolution digital images will be recorded for **all** transmission towers (overview, tower views and base) for survey analysis and standard reporting purposes. Base detail shall show approximately 50m x 50m view.
 - b. High-resolution digital images will be recorded at line span (in between towers) at every 50 meters to perform visual inspection on the conductors' condition; and for environmental surveillance purposes.
 - c. Other views as specified in other sections shall be included.
- ii. HD Video recording for Visual Surveillance / Monitoring (Environmental):
 - a. To monitor the environmental conditions of the EHV transmission line corridors (ROW) for hazards posed by vegetation, ground condition e.g. soil erosion, and intrusion.

Offer (B) - Aerial scanning using LiDAR mount on same flight used by IR & UV (OPTIONAL)

LiDAR Survey (Optional) for environment surveillance and monitoring

- a) To provide geo-referenced data of power lines and monitor the environmental conditions of the EHV transmission line corridors (ROW) for:
 - i. Surveying of catenaries for soft (vegetation) and hard (buildings etc) clearance, ie (Easement right of way management) and infringement surveys
 - ii. Danger object intrusions inclusive of low clearance
 - iii. Falling tree analysis
 - iv. 3D modelling of the towers and catenaries and all surrounding environments
 - v. Topographic mapping of power line corridor for soil erosion control
 - vi. Substations for down lead infringements, safety planning of clearance between plants
 - vii. Asset management – for GIS input
 - viii. Data load directly into PLS-CADD/ GMS
- b) Data captured and presented will enable the client to manage vegetation, get 2D contour and 3D power line corridor representation, power line data extraction, vegetation height and proximity maps, data sets for GIS/GMS.

Offer (C) - Aerial scanning using LiDAR and Visual Inspection of powerline using separate flight from above (All items below are OPTIONAL)

LiDAR Survey (Optional) for environment surveillance and monitoring

- a) To provide geo-referenced data of power lines and monitor the environmental conditions of the EHV transmission line corridors (ROW) for:

- i. Surveying of catenaries for soft (vegetation) and hard (buildings etc) clearance, ie (Easement right of way management) and infringement surveys
 - ii. Danger object intrusions inclusive of low clearance
 - iii. Falling tree analysis
 - iv. 3D modelling of the towers and catenaries and all surrounding environments
 - v. Topographic mapping of powerline corridor for soil erosion control
 - vi. Substations for down lead infringements, safety planning of clearance between plants
 - vii. Asset management – for GIS input
 - viii. Data load directly into PLS-CADD.
- b) HD Video recording to capture the environmental conditions of the EHV transmission line corridors (ROW).
- c) Data captured and presented will enable the client to manage vegetation, get orthophoto mosaic, 2D and 3D power line corridor representation, power line data extraction, vegetation height and proximity maps, data sets for GIS/GMS.

Workflow Methodology

- i. Tenderer shall in their tender offer provide a brief write-up on the operating procedures for the project ie. Pre-scanning/flight preparation, aerial inspection inclusive of ground supports activities; data and product processing workflow.
 - i) The outline shall include the pre and actual flight procedures, operating weather conditions, equipment to be use, numbers and experience of manpower, aerial inspections, post data processing, etc; so as to ensure that inspection results are as accurate as possible. Flow charts shall be included to support the write-up.
 - ii) For LiDAR survey under Option (B) and (C), tenderer is required to provide a brief write-up of the operating procedures for the project incorporating but not limited to the following which are as-applicable. Special emphasis shall be put on what are the measures taken for data capture where slopes > 45° and dense secondary forest situations.

a) System Bench Test

System bench test shall be carried out before project execution to determine and ensure the accuracy of the system within the manufacture's specifications. This process also ensures that the system is in good working order before the actual installation onto an aircraft.

b) Static GPS Survey

Static GPS survey shall be performed to set up baselines/GCPs (Ground Control Points) which later are to be used to position the LiDAR system during data acquisition. Qualified local registered surveyors are to be engaged to observe at least 4 hours for each point to ensure high-accuracy positioning. A GPS network with existing and new GCPs will be created. There will be a minimum of one GCP per 35 km interval. A total of minimum 3 existing control points will be observed and 2 best-suited existing control points will be used to derive the coordinates for new GCPs.

Throughout the static GPS survey exercise, surveyor shall download the relevant JUPEM Continuously Operating Reference Station (CORS) data for the project. This is to ensure that the data can be transformed or connected to any datum even after project completion.

c) Flight Line Design

Tenderer shall design flight lines based on the provided layout by client. The flight lines shall be based on the selected flying height with no flight line overlap. These designed flight lines will be loaded into the LiDAR onboard GPS navigation system for the pilot and the system operator usage during data collection. Co-ordinates of the 1st and last tower will be made available to the successful tenderer upon award.

d) System Installation

The LiDAR system shall be installed onto a helicopter. A test flight shall be carried out before actual data acquisition. Data analysis shall be performed on the test flight data to ensure the system is in order before the aircraft and system mobilize to project area.

e) LiDAR and Imagery Data Acquisition

For each data acquisition mission, a short session of static data collection shall be carried out to initialize the GPS, IMU and the laser of the LiDAR system before takeoff.

LiDAR data is planned to be acquired:

- i. For offer (B), flying height shall be determined by the requirements of offer (A).
- ii. For offer (C), at average 150m above ground level (AGL) with 60° scanning angle and produce a minimum ground swath width of 170m with nadir image width of 130m; and with a minimum 20 laser points per m².

Flying height is variable based on flying below the lowest cloud height to ensure cloud-free simultaneously-acquired imagery. LiDAR data shall be obtained with no overlap between each swath while the downward imagery shall be acquired with 60% front overlap.

The downward imagery will be collected at the same time as the LiDAR data at every 2 seconds interval to ensure there are no gaps in coverage. The downward imagery also will be used for structure still images where each structure will be approximately centred within the captured image. The full height of the structure shall occupy 50% - 75% of the image height.

Forward digital video also shall be recorded at the same time as LiDAR data collection. The video camera used shall be a minimum of 1.2 mega pixels. The digital video shall be captured at an angle of 30 degrees or less from the horizon. The video shall be collected such that it is pointing towards the center of the transmission line corridor

regardless of aircraft movement. Tenderer shall use a gyroscopic stabilizer to ensure a smooth video.

Calibration passes shall be carried out before and after each mission throughout the project for data verification and monitoring the roll, pitch and heading to avoid misalignment angles in LiDAR point cloud.

Tenderer shall survey crossing lines of all types (distribution and transmission) to the first crossing structure either side of the project line right of way centerline.

In the event that during the LiDAR survey, the following conditions are present, tenderer shall stop the data acquisition:

- a) Temporary flooding
- b) Atmospheric conditions containing smoke, haze, fog
- c) Sun inclination less than 20 degrees measured from the horizon
- d) Rain or low cloud ceiling
- e) Maximum speed of the wind perpendicular to the line is greater than either 25 km/h (15 mph, or 7 m/s) for small conductors (below 795 MCM, or below 1 inch diameter), or 40 km/h (25 mph, or 11 m/s) for large conductors (795 MCM and above, or 1 inch diameter and above)

In order to minimize the modelling error due to fluctuating weather conditions, a dead end line section shall be completed from beginning to end in as short a time frame as possible. A dead end section is defined as a line segment from one dead end tower to the next dead end tower including both dead end towers and all spans between them. The maximum allowable flight operation over any dead end section is one hour. A longer duration is acceptable provided weather conditions along the line remain fairly constant.

In the event that complete line data collection is not possible, tenderer shall assess the following factors:

- a) Dead end sections - If data collection on a line was started but due to unforeseen reasons was not completed, all completed between dead end sections are salvageable. The resumption of data collection shall start at the end of the last completed dead end section. The operator shall record all times and advise the data processor of the situation prior to leaving the area to ensure data is acceptable for analysis.
- b) Suspension of data collection in a long dead end section - If problems occur that suspend data collection in a long dead end section (sections with 50 spans or greater), resumption of data collection can occur as provided for in item (c) below. There shall be at least a two (2) span overlap of data at the point where data collection was suspended. The operator shall record all times and advise the data processor of the situation prior to leaving the area to ensure data is acceptable for analysis.
- c) Elapsed time during data collection - In the event that problems occur during line data collection and continuous data collection is suspended, the

data collection can be resumed provided that a time frame of no longer than 1 hour has elapsed from suspension of data collection to recommencement.

In the event that conditions described in Item (a), (b) and (c) are not met, the section will be unusable and will be re-flown by tenderer at no additional costs.

During data acquisition, the aircraft shall maintain a constant flying height to ensure that there are no data voids. Also, tenderer shall ensure there are no data voids by daily checking of collected data, such that any data voids would re-flown the next day. This contingency shall be included into plan schedule and thus no variation in costs and change to completion time of project due to the re-flown is allowed.

f) Ground Check Points Survey

A minimum of 50 ground check points shall be collected for each powerline for which LiDAR data is to be verified. The check points should be performed at the calibration passes area or at selected open flat terrain. Ground check point surveys should be performed relative to project reference system using the very same monuments used as GPS base stations for airborne GPS control. These ground check points are used to ensure the quality and accuracy of LiDAR data.

g) Kinematic GPS processing

Tenderer shall check the GPS predicted almanac for the GPS satellite visibility in the project area to determine the best data acquisition time. During each LiDAR mission, tenderer shall log GPS data from GCPs and system aboard aircraft at 1 Hz rate. Tenderer shall perform kinematic differential GPS (DGPS) processing by combining the two sets of GPS data for positioning solution of the aircraft. Tenderer shall keep a maximum 35km distance between the GCPs and aircraft all times to ensure accuracy in the post processing solutions.

Processing is divided into 3 parts namely the processing of trajectory, data processing from laser scanner and photo processing. Trajectories from GPS observations shall be connected to the data from inertia measurement system. Flight data is then linked to the flight trajectory. Photo time stamps acquired from flight trajectory processing shall also be linked to their respective photo.

h) Raw LiDAR Data processing

The 3D point clouds shall be produced using tenderer proprietary software. The GPS, IMU and waveform laser data will be combined and output in Universal Transverse Merator (UTM) coordinate system with ITRF00 datum. The final point cloud will be transformed to Rectified Skew Orthomorphic (RSO) coordinate system and based on MyGeiod datum.

i) LiDAR Data Quality Analysis

The quality of the processed LiDAR data shall be checked and reviewed daily after each flight mission during the project after completion of data acquisition. Several analyses shall be performed on the LiDAR data before finalizing the point cloud

including comparison with independent ground check point. The imagery data will be reviewed to assure high resolution cloud-free imagery. Comparison is to be carried out using the final ground points in Micro-station and TerraScan software in order to confirm the quality of the Lidar data.

j) LiDAR DATA PROCESSING requirements

Filtered ground points should be filtered / thinned by using an algorithm that provides points with a relative change in level of not more than 0.2m and a maximum point to point spacing of not more than 5.0m.

Non-ground points should only contain points higher than 1.0m above the digital terrain model created for the survey. All points between 0.0m and 1.0m above the digital terrain model shall be removed from the "basic" data, and supplied in the "uncertain.xyz" file. The vegetation point density shall be sufficient so as to enable the extent of trees and shrubs higher than 2 metres to be fully defined. Vegetation lower than 2m in height above the ground plane shall be filtered out; and supplied separately.

The filtered ground data and ortho-photos shall be combined into a GMS/PLS-CADD model in the format specified. Full ground data, filtered ground data and non-ground data shall be provided as separate xyz files.

The LiDAR survey shall return points on aerial crossing cables (such as distribution lines running in any direction relative to the flight path) as small as 10mm in diameter located about 6m above ground level.

k) Ground Editing, Quality Control, Feature Coding (DTM & DEM processing)

An automatic ground classification routine will be performed on the final 3D point clouds. Experienced staff shall carry out manual checking on each LiDAR data set to verify the automatic ground classification. All the verified data shall be checked before output of the final DTM and DEM data.

Feature coding of the ALS data is to be carried out by competent operators who have a working knowledge of both GMS/PLS-CADD and high voltage transmission line requirements. The Contractor shall add the structure functional location number and circuit/feeder number to the "profile comment" field, and the structure type (or pole material and pole type) to the "plan comment" field for each structure.

The features from the LiDAR data will be classified to the point classes indicated in Table 3.

Feature Code	Description
4	MEDIUM VEGETATION (0.25 M TO 1.0 M)
5	HIGH VEGETATION (ABOVE 1.0M)
200	GROUND DTM

Feature Code	Description
201	INTERPOLATED GROUND PTS
203	BOULDERS/ROCKS
204	DITCH
205	CREEK
206	POND
302	BRIDGE
310	DIRT ROAD
320	PAVED ROAD OR STREET
330	SECONDARY HIGHWAY
400	FENCE
402	SIGN
521	WOOD POLE
522	OTHER TRANSMISSION / STRUCTURE
523	COMMUNICATION TOWER / OBJECT
526	DOWN GUY
528	STRUT GUY
540	STUDY LINE STRUCTURE
541	STRUCTURE CENTER 1
542	STRUCTURE CENTER 2
550	OVERHEAD TRANSMISSION
560	SECONDARY TRANSMISSION
570	OVERHEAD SUB TRANSMISSION
801	STREET / TRAFFIC LIGHT

Feature Code	Description
802	PIPE LINE U / G
807	TREE/HIGH VEGETATION
812	PARKING LOT / ENTERENCE
813	TRAIL
814	BUILDING/CABIN
824	DRIVEWAY
828	FIELD ACCESS
829	CULTIVATED FIELD / FARM LAND
851	WATER
852	WETLAND
853	GULLIES / RAVINES
896	DIST LINE CROSSING ATTACHED
897	DIST LINE CROSS IN-SPAN
898	TRANS LINE CROSSING ATTACHED
899	TRANS LINE CROSSING IN-SPAN
950	RECREATIONAL AREA
998	WALKWAYS
999	MISC / CARAVAN
1000	STATION OBJECTS
1010	STATION YARD GROUND PTS
1100	CONSTRUCTION AREA
1200	URBAN DEVELOPED AREA OBJECTS
1210	URBAN DEVELOPED AREA

Feature Code	Description
1310	CONTAINER
1320	STORAGE TANK
2100	ABOVE GROUND PIPE
2111	SILO
2115	FARM FACILITY
2116	FARM FACILITY AREA
9999	WEATHER STATIONS

The DTM shall be tiled into areas (cluster of 10~ 20 towers) which result in manageable file sizes. The tile at a substation shall encompass the entire substation area. The name of the tile shall match the SEB substation name. The transmission line corridor tiles shall be named using the SEB transmission line name plus a sequential numerical suffix. The software used shall be Terra Scan and Terra Modeller.

l) Orthophoto Mosaic

Terra Photo software shall be used to generate orthophoto mosaics for the entire project area. Tie points created for each image and the cleaned bare earth DTM points shall be used to ortho rectify the images and the final orthophoto mosaic images shall be checked with LiDAR point cloud.

Individual digital images shall be produced into a strip mosaic and tiled to match the same extents of the LiDAR point cloud tiles. Naming of the image tiles shall match the corresponding LiDAR point class tile.

For structure still images, the images shall be annotated with the line name, structure number and location as required by SEB. The naming of the images shall correspond to the circuit name and structure number.

m) Forward Digital Video Data Processing

Forward digital video collected along the study line capturing the full width of the right-of-way shall provide sufficient detail to determine features along the line. The files shall be delivered in avi or wmv format. The video files shall be annotated with date/local time and easting/northing coordinate. The annotations shall be embedded in the video or be added post-production with the use of a subtitle container file such as .smi or .srt. The video files shall be named according to the circuits in the corridor.

Each video shall be continuous in real time and free of cuts or other time-related editing. If the video must be stopped and restarted during the flight, a new video file shall be created at the start of the new recording. A kmz file shall be provided for each video file and named the same as the video file. The kmz file shall contain a place-mark for each second of video. Each place-mark shall contain the following information:

Date and local time stored in the name property (2015-7-22_14:13:05)
Longitude, Latitude and Elevation stored in the Point coordinates property (-122.2602216667,46.059006667,253)
Date, Local Time, Heading, Speed, Aircraft Elevation, Latitude, Longitude, Northing and Easting stored in the Description property.
This video shall be tiled to match LiDAR files and integrated within GMS/PLS-CADD.

n) Transmission Line Modeling in PLS-CADD

The transmission line modelling shall be constructed using GMS/PLS- CADD software. The x,y,z points will be processed and filtered in the model. All feature coded points, model key points, will be saved and backed up with GMS/PLSCADD. Points considered surplus shall be similarly backed up into archived GMS/PLSCADD files. All point data will be available in original format saved in LAS archive files. Using ground model key points which are derived from the raw ground point layers, TIN models shall be created in GMS/PLS-CADD. Structure families made with stick geometry shall be composed, named and numbered to Sarawak Energy Berhad's specification. All cables shall be sagged in accordance to the best fit LiDAR returns on cables.

o) Vegetation Detection Report

A vegetation study shall be conducted and a report detailing locations of encroaching vegetation to conductor shall be produced.

p) Features Digitizing and Final Mapping

Micro-station and AutoCAD software shall be used for features digitizing and final mapping. The ortho-rectified imagery shall be subset based on the required scale and the features digitizing shall be performed on the subset imagery.

q) Survey Report

A Survey Report shall be provided in PDF format. The survey report shall include the following items;

1. Control Point and Check Point Names and Coordinates
2. LiDAR Control Network Adjustments
3. Horizontal Datum
4. Mapping Projection
5. Vertical Datum
6. Geoid Model
7. LiDAR Data Collection Parameters
8. Imagery and Video Collection Parameters
9. LiDAR Data Calibration Procedures
10. Fundamental Vertical Accuracy Statement

Equipments

- i. Tenderer shall in their tender offer provide detail technical information of the equipments proposed for the project.

Aircraft Fitness

- i. To specify proposed aircraft for operation.
- ii. Aircraft shall comply with the requirements set by the Malaysian Department of Civil Aviation (DCA) for close-proximity power line flying.
- iii. The equipment installation on the aircraft shall be certified suitable by the Malaysian DCA. Costs shall include for all cost related to securing of necessary approval/permit to carry out the project successfully.

Capacity and Qualifications of operators

i. Offer (A) and (B)

The tenderer shall in their tender offer present all the key personnel names and cv of operators for project; both operations, technical support and back office staff.

- a. Operators shall be highly trained and experienced. The helicopter pilot shall preferably has local terrain low level flight recognisance experience; and has power line aerial scanning experience. The pilot shall keep the helicopter about _____ meters above and _____ meters at the side of the overhead power line for inspection and recording. Whenever any fault is located, the helicopter shall fly as near as practical for the close up detail shot preferably with a zoom camera. The helicopter shall be flown at a cruising speed of _____ kmh so as to ensure that image captures are sharp and accurate.
- b. IR camera operators shall be certified Infra Thermography Level 1 certificate holders.
- c. Technical Support Team thermographers shall be active power line inspectors and have at least 30,000 km of airborne remote sensing experience on powerlines. The project shall be preferably oversee by Infra Thermography Certified Level 2 operator in order that Thermal imaging reports are as accurate as possible.

ii. Offer (C)

As like for Offer (A), the tenderer shall in their tender offer present all the key personnel names and cv of operators for project; both operations, technical support and back office staff.

- a. Operators shall be highly trained and experienced. The helicopter pilot shall preferably has local terrain low level flight recognisance experience; and has power line aerial scanning experience. The pilot shall keep the helicopter about _____ meters above and _____ meters at the side of the overhead power line for inspection and recording. Whenever any fault is located, the helicopter shall fly as near as practical for the close up detail shot preferably with a zoom camera. The helicopter shall be flown at a cruising speed of _____ kmh so as to ensure that image captures are sharp and accurate.
- b. LiDAR operators shall be preferably active powerline inspectors and have _____ km of airborne remote sensing experience.

- c. Technical Support Team shall be active power line inspectors and have _____ km of airborne remote sensing experience on powerlines.

Project Schedule

- i. The tenderer shall provide an outline of his proposed schedule highlighting key activities for the completion of the project in the tender offer inclusive of any workflow diagram. Tenderer is to note that it is the tenderer's responsibility to acquire the necessary relevant authorities approval which includes the DCA, local government, army, etc. SEB shall only be responsible for the provision of the necessary of support letter confirming the scope of works. Tenderers are advised to check with the local counterpart on the expected time required to acquire the necessary approvals and no time extension and costs due to delays in obtaining the necessary approval is permitted.

Cost Estimates

- i. The tenderer shall specify in his offer the detail breakdown of costs for the completion of the project in the tender offer. Costs shall include for all incidental cost like engagement of 'service providers', if any, to obtain the necessary authorities' approval, standby time due to weather or other environmental factors.
- ii. Tenderer shall specify in their tender offer the scope limit for each option with reference to applicable specifications stated in this tender. All incidental costs for deviance from tender specification's requirement shall be provided in the tender offer as a separate attachment.

Deliverables

- i. Digital copy of Aerial CBM Scanning Inspection Analysis Reports of entire line. Each snapshot/photo shall be presented with but not limited to exact GPS tagging for asset reference, pylon ID number. The contents shall consists of:
 1. Visual Inspection HD video film; and HD photo and survey analysis of every EHV Transmission Tower (Minimum 5 photos per tower comprising of wide view, 2 nos. top steel structure view; and 1 no. lower steel structure with its foundation base view (50m x 50m) including slopes); and
 2. Infrared & Corona CBM image and analysis of every tower of the designated EHV Transmission Overhead Lines. Thermo vision data shall be capture at an interval of not more than 1 second in color on a portable computer.
 3. HD digital image at 50 metres intervals of power lines corridor (Average 3 per span)
 4. Visual monitoring highlights of any possible hazards posed by vegetation, ground condition e.g. soil erosion, or intrusion.
 5. Highlights on points of overheating and/or corona issues. Report shall include a thermo gram of overhead point (wide and zoom with 20° & 5° lens respectively)/ snap shot of corona count together with wide view

photographs (min. 14.7 megapixel) of location/pylon, detail photographs (overview of tower, view of faulty equipment and close-up view of faulty mechanical component) of overhead point/ corona issue point, data representing conditions of inspection, exact data of temperature difference/ corona count measured.

- a. For overheat points, the following shall be capture:
 - 5° (zoom) thermovision image with GNSS stamp
 - 20° (wide view) thermovision image with GNSS stamp
 - Video clip with GNSS stamp
 - High resolution photo image (wide view and detail view)
 - GIS/GMS notes (position data, weather data, type of overheat element ...)
- b. For corona faults, the following shall be capture:
 - Corona record with GPS
 - Video record with GPS
 - High resolution photos (wide and detail views, faults clearly marked with arrows and explanation in text) with GPS, pylon number
- c. For visual faults, the following shall be capture:
 - Video record with GPS
 - High resolution photos (wide and detail views, faults marked with arrows and explanation in text) with GPS, pylon ID number
 - A summary table for each type of fault shall be made available
 - Visual inspection report in GMS program

- ii. Edited video of IR CBM Scanning, Corona UV Scanning and HD Surveillance with GPS overlay of whole line and inclusive but not limited to:

- a. Separate short clips for each overheating, corona detection point with matching video.
- b. IR,UV and HD of entire power line (inclusive of sectioning data into tower sectors of 10~20 towers)
- c. All deliverables must be submitted to SEB within _____ days from the “Scanning Completion” date of each transmission line section.

- iii. Critical Brief / Quick Report

Findings of SERIOUS DEFECTS will be reported to SEB within max. 48 hours of detection.

- iv. Edited LiDAR scanning as applicable to Option B consisting of the following.

1. Scan of power line and corridor shall be to a width of minimum 50 m (including start and end substation)
2. Prepare classified point cloud. Wires, pylons, high vegetation, low vegetation, ground, buildings, roads, etc shall be classified separately. Tenderer to provide a list of classification applicable in contract in tender offer.

3. Provide:
 - i. 3D vector graphics (vectorized roads, buildings, wires)
 - ii. Point cloud cross section view, profile view
 - iii. 2D Contours
4. Include:
 - i. Photo processing
 - ii. Corridor vegetation management (vegetation height extraction)
 - iii. Corridor danger objects and critical distance analysis.
5. Point density required is 65 points per m² or more.
6. Provide LiDAR data in raw, classified and RGB format, inclusive but not limited to ASCII point files and LAS format, DEM, DSM, DTM, Height, 3D classification, etc ready for use in PLS Cad, ArcView, MOSS/MX, Auto desk, ESRI, Microstation V8, MapInfo Xpswmn. Tenderer to specify other files included in offer.
7. Other requirements are summarized as follows:
 - i. Forward Digital Video in AVI or WMV Format
 - ii. Video Companion File in KMZ Format
 - iii. Forward Digital Structure Imagery in JPEG Format
 - iv. Data Collection Times in MS Excel Format
 - v. Index file for DTM tiles, GCP locations, Structure centres with structure number, transmission line alignment and video flight path in CAD Drawing Format
 - vi. Transmission Line Model in GMS/PLS-CADD format
 - vii. Vegetation Detection Report in PDF format
 - viii. Features Digitizing and Final Mapping in CAD Drawing Format
 - ix. Survey Report in PDF format
- v. Edited LiDAR scanning as applicable to Option C consisting of the following:
 1. All requirement in Item iv above is applicable to here
 2. Other requirements are summarized as follows:
 - i. Digital Elevation Model (DEM) of point cloud in LAS 1.2 format
 - ii. Digital Terrain Model (DTM) of point cloud LAS 1.2 format
 - iii. Structure Centre Data in ASCII Text Format
 - iv. Digital Ortho Imagery in ECW, TIFF Format
 - v. Forward Digital Video in AVI or WMV Format
 - vi. Video Companion File in KMZ Format
 - vii. Forward Digital Structure Imagery in JPEG Format
 - viii. Data Collection Times in MS Excel Format
 - ix. Index file for DTM tiles, Ortho tiles, GCP locations, Structure centres with structure number, transmission line alignment and video flight path in CAD Drawing Format
 - x. Transmission Line Model in PLS-CADD format
 - xi. Vegetation Detection Report in PDF format
 - xii. Features Digitizing and Final Mapping in CAD Drawing Format
 - xiii. Survey Report in PDF format

- vi. The Final Report (hard copy) shall contain:
 1. Gantry / Outdoor Substation reference
 2. GPS Coordinates
 3. Radiometric IR Image of each tower
 4. Corona Image of each tower
 5. Visual Image, wide view and detailed photographs [incl. clearly marked with arrows and explanation in text of any fault(s)] of each tower
 6. Evidences and Analysis on detected defective components i.e. Fault Temperature, Corona Counters, Visual Observances, its severity and recommended rectification time frame, if any.
 7. A summarised report of each powerlines, including all overheating points, faults found by UV and visual inspections, all locations and quantity of danger vegetation and all location with danger objects (objects too close to conductors).
- vii. The Final Report (digital copy) shall be:
 1. Submitted in 3 sets of digital copies in external hard drives for entire power lines, all the Infrared scanning inspection, Corona scanning inspection, HD Visual Surveillance scanning, LiDAR scanning CBM Analysis scanning video and images; Infrared, corona, high resolution images of each tower as well as photography of corridor, summary of quick report, final report, etc; and
 2. Each of the high resolution still images shall be labelled with tower names and relevant WGS-84 GPS coordinates.
 3. All deliverables will be submitted to SEB within _____ from the “scanning completion” date.
- viii. GIS/GMS software(s) (Provisional) for users to plan inspections, inspect captured data inclusive but not limited to flight video (stored in sectors of 10~20 towers), display of classified point cloud data in 3D (with possibility to fly over the entire point cloud terrain), profile view of terrain, power lines, measurements of distances, and generate reports in a map based user interface. Platform shall be web-based, running in all modern browsers. Data in industry standards (eg QGIS, ArcGIS, etc) shall be capable of being viewed on desktop computers, tablets, and smart phones. GIS software(s) product shall have the following features:
 - Display of spatial data (raster and vector)
 - LiDAR data display
 - point cloud viewer (with possibility to fly over the entire point cloud terrain)
 - profile terrain view
 - display of raw, classified and RGB LiDAR points
 - visual inspection display (e.g., spatial feature about a tower also displays pictures taken during visual inspection)
 - IR data display
 - Flight video playback (updated location of aerial vehicle is displayed on the map while the video is playing)
 - Report generation (generation of reports based on inspected data)
 - Software needs to work cross-platform:

- Desktop (Windows, Linux, OS X) - primarily used in the office,
- Mobile (Android and iOS) - used by workers in the field, and
- Tablet (Android and iOS) - used by workers in the field
- at least 10 years of support of the software
- minimum 100 user licenses (Optional)

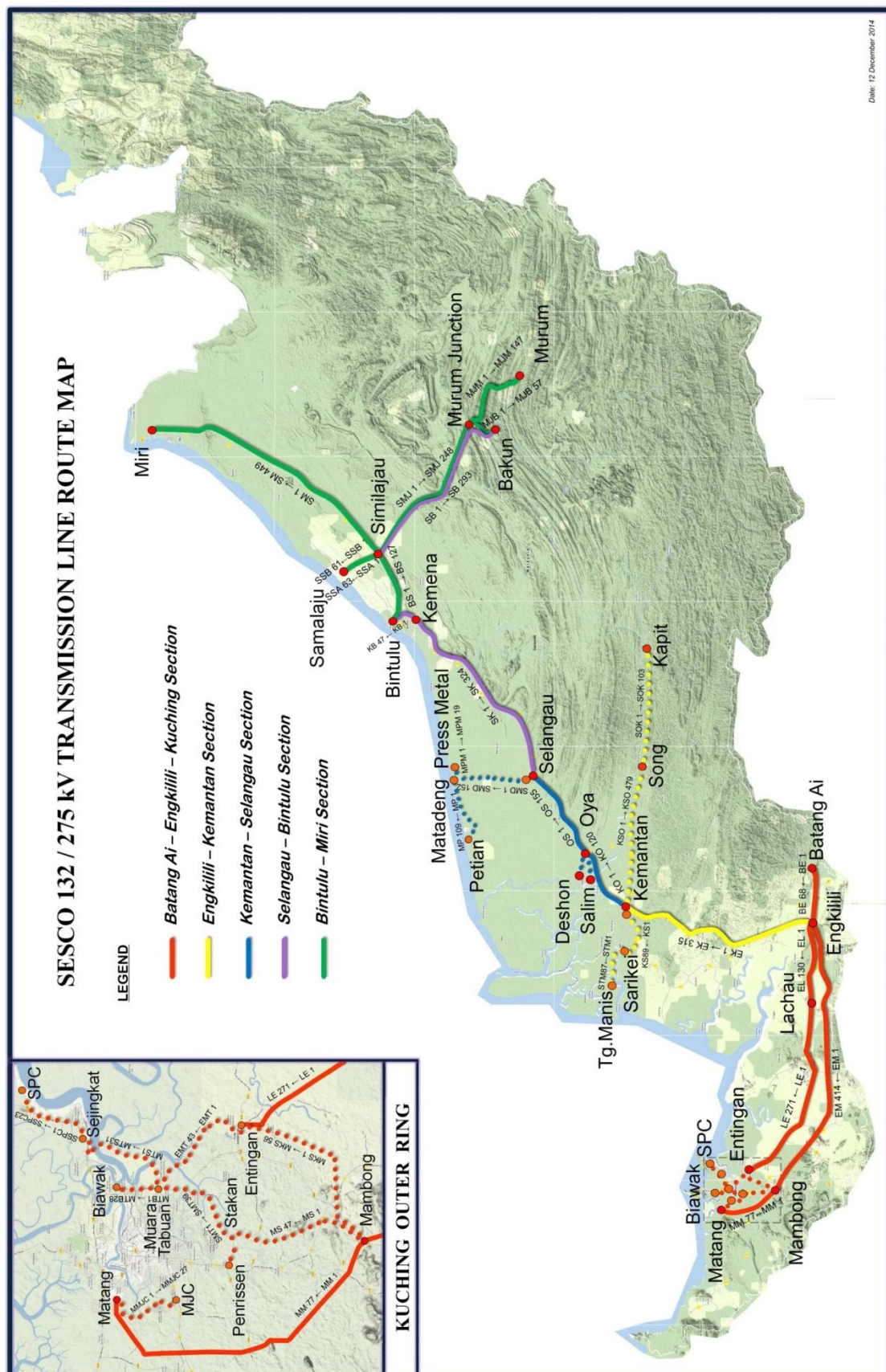
Tenderer is required to present all features offered in the tender package and to provide information on the software(s) provided together with catalogues, if any.

1. All inspection data shall be imported into GIS/GMS software for management of power line system. Imported data shall include all of the above deliverables. All data inclusive of faults/defects found will be referenced to their exact locations. Basic data layers used for mapping purposes shall be BING/JuPem maps or other format whichever is available. Locations with vegetation close to lines will be clearly marked. Each pylon will be equipped with mask of all the photographs taken and other data if provided by client. All reports on IR/UV and visual inspections, photographs and video film shall be implemented in GIS/GMS and attached on exact location to enable access by simply clicking on pylon location.

Annexure A – SEB Transmission Line Network

Item			Distance (km)	Total No. of Towers
	Start point	End point		
1	Batang Ai	Engkilili	25.6	68
2	Engkilili	Lachau	47.1	132
3	Lachau	Entingan	104.1	271
4	Engkilili	Kemantan	111.4	315
5	Kemantan	Song	106.3	479
6	Song	Kapit	40.9	103
7	Kemantan	Oya	40.0	120
8	Oya	Selangau	58.8	155
9	Selangau	Kemena	118	324
10	Kemena	Bintulu	18	47
11	Bintulu	Similajau	44.6	127
12	Similajau	Tudan	153.2	449
13	Similajau	Murum Junction	90.2	247
14	Murum Junction	Bakun	20.8	57
15	Murum Junction	Murum	47.6	147

Annexure B – Drawing of SESCO 132/275kV Transmission Line Route Map



**TENDER FOR AERIAL SCANNING AND INSPECTION FOR
132/275KV TRANSMISSION LINE TOWERS**

TENDER REF. NO.: 210103ASI/15

PART I – TENDER PROCEDURES

SECTION 2 – TENDER PARTICULARS

These Tender Particulars specify matters particular to this tender process and should be read in conjunction with the Instructions to Tenderers set out in Part I, Section 3 of the Tender Documents.

Tender Particulars Tender for aerial scanning and inspection for 132/275kV Transmission Line Towers			
No.	Clause Reference	Description	Details
1.	Clause 1.1(c)	Closing Date and Time	9 th September 2015, <i>not later than</i> 3:00 pm
2.	Clause 1.1(u) and Clause 9	Sarawak Energy's Representative	<i>Name</i> and designation: Project Manager: Mr. Robert Cheu Contact details: Tel No.: 082 – 388388 Fax No.: 082 – 342322
3.	Clause 1.1(dd)	Tender Validity Period	The period commencing from the Closing Date and Time and expiring on the date falling ninety (90) days from the Closing Date and Time
4.	Clause 24.1	Pricing Method	Bill of Quantity
5.	Clause 28.1	Value of Tender Security	The value of the Tender Security must be 2% of the Tender Price up to a maximum of RM100, 000.00, remains valid for a minimum of 60 days beyond the Tender Validity Period (including any extension of the Tender Validity Period).
6.	Clause 31.1	Copies of Tender Offer	The Tenderer shall prepare and submit: one (1) original version of Part II; of its Tender Offer
7.	Clause 32.1(b) and Clause 33.1	Address for submission of Tender Offers	Delivery by hand or by courier to: The Chief Executive Officer Sarawak Energy Berhad Tender for Aerial Scanning and Inspection for of 132/275kV Transmission Lines Tender Box, 8 th Floor Menara Sarawak Energy No. 1 The Isthmus 93050 Kuching Sarawak Malaysia

TENDER FOR AERIAL SCANNING AND INSPECTION FOR 132/275KV TRANSMISSION LINE TOWERS

TENDER REF. NO.: 210103ASI/15

PART I – TENDER PROCEDURES

SECTION 3 – INSTRUCTIONS TO TENDERERS

These Instructions to Tenderers specify those procedures to be followed by Tenderers in the preparation and submission of their Tender Offer. Information is also provided on the process for the submission and evaluation of tenders and award of contract. These Instructions to Tenderers shall be read in conjunction with the matters set out in the Tender Particulars set out in Part I, Section 2 of the Tender Documents.

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A. GENERAL**1. Definition and interpretation****1.1** For the purpose of these Instructions to Tenderers:

- (a) **"Affiliate"** means, in relation to any person or entity, a subsidiary of that person or entity or a holding company of that person or entity or any other subsidiary of that holding company;
- (b) **"Authorised Signatory"** means the person (or persons) authorised by the Tenderer to exercise the rights and powers and perform the functions set out in Clause 23.1;
- (c) **"Closing Date and Time"** means the date and time by which Tender Offers are required to be received by Sarawak Energy, as set out in the Tender Particulars;
- (d) **"Companies Act"** means the Companies Act 1965 (Act 125);
- (e) **"Consortium Tenderer"** means a Tenderer formed by way of an unincorporated joint venture or consortium between two or more members;
- (f) **"Contract"** means the contract to be entered into between Sarawak Energy and the successful Tenderer, as selected by Sarawak Energy in accordance with this tender process, as set out in the Form of Contract;
- (g) **"Corporate Authorisation"** means with respect to a Tenderer (or member of a Consortium Tenderer):
 - (i) a properly executed board or shareholder resolution;
 - (ii) a power of attorney; and / or
 - (iii) such other evidence of authority,in each case satisfactory to Sarawak Energy and which authorises such Tenderer's Authorised Signatory in accordance with the requirements of Clause 23;
- (h) **"Eligibility Requirements"** means the eligibility requirements for each Tenderer (or members of a Consortium Tenderer), as set out in the Tender Particulars;
- (i) **"Form of Contract"** means the documents listed under the heading "Form of Contract" in Part I, Section 4 of the Tender Documents;

- (j) **"Form of Tender"** means the document entitled "Form of Tender" set out in Part II, Section 1 of the Tender Documents, which is required to be completed by the Tenderers and submitted with their Tender Offer;
- (k) **"GST"** means goods and services tax payable in accordance with the Goods and Services Tax Act 2014;
- (l) **"Instructions to Tenderers"** means this document;
- (m) **"Key Employee"** means, any employee of Sarawak Energy or an Affiliate of Sarawak Energy that is responsible for the management or administration of budgetary or procurement decisions;
- (n) **"Letter of Award"** means, the letter of award issued by Sarawak Energy to the successful Tenderer for the Works;
- (o) **"Local Participation"** means (in descending order of preference):
 - (i) business entities registered with the UPKJ as having Bumiputera status within Sarawak (or, where such UPKJ certification is not possible, certification by another suitable authority acceptable to Sarawak Energy);
 - (ii) Sarawak-based business entities registered with the UPKJ;
 - (iii) other business entities registered and incorporated in Sarawak and majority owned and controlled by Sarawakians; and
 - (iv) any other business entities registered and incorporated in any State of Malaysia and majority owned and controlled by Malaysians;
- (p) **"Pricing Appendix"** means the document entitled "Tender Appendix B – Tender Price" set out in Tender Appendices which sets out the manner in which the Tender Price shall be calculated;
- (q) **"Related Party"** means:
 - (i) with respect to a non-Consortium Tenderer, director, partner or an officer of such Tenderer; and
 - (ii) with respect to a Consortium Tenderer, a director, partner or an officer of any of the members of such Consortium Tenderer;
- (r) **"Sales Tax"** means sales tax payable in accordance with the Sales Tax Act 1972;
- (s) **"Sarawak Energy"** means Sarawak Energy Berhad (company number 007199-D);

- (t) **"Sarawak Energy Director"** means any director of Sarawak Energy, or any director of an Affiliate of Sarawak Energy;
- (u) **"Sarawak Energy's Representative"** means the person named in the Tender Particulars as its main point of contact with the Tenderer and / or the Tenderer's Representative for the purposes of this tender process;
- (v) **"Services Tax"** means service tax payable in accordance with the Service Tax Act 1975;
- (w) **"Taxes"** means all direct and indirect taxes imposed in any jurisdiction by any governmental entity or semi-governmental entity (including any government authority), including income taxes, corporate taxes, withholding taxes, goods and services taxes (or any other similar value added taxes), customs duties, fees, levies, imposts, charges, royalties (including quarry royalties), dues or assessment of any nature;
- (x) **"Tender Appendices"** means the appendices set out in Part II, Section 2 of the Tender Documents and required to be completed by the Tenderer and submitted with their Tender Offer;
- (y) **"Tender Documents"** means those documents issued to the Tenderer as part of this tender process, as may be amended in accordance with any addendum issued by Sarawak Energy in accordance with these Instructions to Tenderers;
- (z) **"Tender Offer"** means those documents comprising the formal offer for the performance of the Works required to be completed by the Tenderer which is to be submitted to Sarawak Energy by the Closing Date and Time in accordance with these Instructions to Tenderers;
- (aa) **"Tender Particulars"** means the tender particulars set out in Part I, Section 2 of the Tender Documents, setting out those matters particular to this tender process;
- (bb) **"Tender Price"** means the price or amounts calculated by reference to the matters set out in the Pricing Appendix and as may be amended in accordance with the matters set out in these Instructions to Tenderers;
- (cc) **"Tender Security"** means the security required to be submitted by each Tenderer with their Tender Offer;
- (dd) **"Tender Validity Period"** means the period of time during which each Tenderer's Tender Offer shall remain valid and open for acceptance by Sarawak Energy as set out in the Tender Particulars (as may be extended from time to time in accordance with these Instructions to Tenderers);

- (ee) "**Tenderer**" means any entity or group of entities (in the case of a Consortium Tenderer) issued with a copy of the Tender Documents or otherwise invited by Sarawak Energy to submit a Tender Offer;
- (ff) "**Tenderer's Representative**" means the person (or persons) authorised by the Tenderer to act as its main point of contact with Sarawak Energy and / or Sarawak Energy's Representative for the purposes of this tender process;
- (gg) "**UPKJ**" means Unit Pendaftaran Kontraktor dan Juruperunding;
- (hh) "**Variation**" means any variation to the execution of the Works, including to increase, decrease, substitute or omit any part of the Works or the method, sequence or timing of the Works and the Contractor shall comply with any such direction; and
- (ii) "**Works**" means all the work and design (if any) to be executed by the Contractor including temporary work and any Variation.

1.2 Throughout the Tender Documents:

- (a) unless the context otherwise requires, all:
 - (i) words and expressions used in these Instructions to Tenderers shall be interpreted in accordance with the matters set out in the Form of Contract; and
 - (ii) capitalised terms used in these Instructions to Tenderers shall, unless otherwise defined in these Instructions to Tenderers, have the meaning assigned to them in the Form of Contract;
- (b) all capitalised terms used in the Tender Documents shall, unless otherwise specified, have the meaning assigned to them in these Instructions to Tenderers (and, to the extent that Clause 1.2(a)(ii) applies, in the Form of Contract);
- (c) any reference to a "Clause", a "Part" or a "Section" is a reference to a clause, a part or a section of the Tender Documents; and
- (d) where both words and alphanumeric figures are used to express the same number, and they are inconsistent, the words shall prevail.

1.3 Wherever the Tender Documents provide for the giving or issuing of approvals, certificates, consents, instructions, permissions, determinations, notices and requests, these communications shall be in writing and shall be delivered by hand, sent by mail, electronic means or courier, to the other Party's Representative, as may be updated by either Party from time to time, by notice to the other Party. Sarawak Energy shall not

be bound by any verbal communication made by any of its officers, directors, employees or agents.

- 1.4 Clause 2, Clause 17, Clause 18, Clause 27, Clause 28, Clause 36, Clause 37.4 and any other, additional clauses of these Instructions to Tenderers which, by their nature, are intended to survive the cancellation, conclusion or termination of the tender process, shall survive the cancellation, conclusion or termination of the tender process.

B. TENDER DOCUMENTS AND TENDER PROCESS

2. Status of information provided by Sarawak Energy

- 2.1 Sarawak Energy does not warrant the accuracy and completeness of the information provided or conveyed to each Tenderer during the tender process, which is provided to Tenderers for their assistance only and, unless expressly included in the Form of Contract, such information shall not form part of the Contract to be entered into with the successful Tenderer.
- 2.2 Each Tenderer should conduct their own investigations and analyses of the information set out in the Tender Documents and by submitting a Tender Offer, the Tenderer shall be deemed to have made its own enquiries, deductions and conclusions regarding the extent of work required (and the cost to be incurred) to perform the Works.

3. Compliance with requirements of the Tender Documents

- 3.1 Failure by the Tenderer to furnish all information and documentation required by the Tender Documents, including in the format required, may result in its Tender Offer being rejected.
- 3.2 The Tenderer is deemed to have examined, understood and agreed to the Form of Contract. The Tenderer is not entitled to propose any deviation to the Form of Contract.

4. Tender Offers from Consortium Tenderers

- 4.1 No changes to the composition of any Consortium Tenderer shall be permitted after the Closing Date and Time without the prior written consent of Sarawak Energy.
- 4.2 If a Consortium Tenderer is selected as the successful Tenderer, Sarawak Energy reserves the right, in its sole and absolute discretion, to opt to include each member (or the ultimate parent companies of such members) of such Tenderer to enter into the Contract together with the Tenderer on a joint and several basis and the Tenderer shall (and shall procure that each of its members shall) contract on such a basis.

4.3 Tender Offers submitted by a Consortium Tenderer shall also comply with the following additional requirements:

- (a) the Tender Offer (and the Tender Offer shall include an undertaking that in case of a successful Tender Offer, the Contract) shall be signed so as to be legally binding on all members on a joint and several basis;
- (b) each member of the Consortium Tenderer shall provide a Corporate Authorisation in accordance with Clause 23.3; and
- (c) the Tender Offer shall include all information and documentation specified as applicable for Consortium Tenderers in the Tender Documents.

4.4 Each Consortium Tenderer shall at all times comply with any legal requirements applicable to Consortium Tenderers in Sarawak.

5. **Tender briefing**

5.1 For the assistance of all Tenderers, Sarawak Energy may arrange a tender briefing on such date(s) and time(s), and at such location(s), as set out in the Tender Particulars. Attendance at a tender briefing is mandatory.

5.2 Not later than two (2) days prior to a tender briefing, the Tenderer shall inform Sarawak Energy's Representative of the persons that will be attending the tender briefing on its behalf (limited to a maximum of three (3) persons).

6. **Site visit**

6.1 For the assistance of all Tenderers, Sarawak Energy may arrange a site visit on such date(s) and time(s), and commencing from such meeting point, as set out in the Tender Particulars. Attendance at a site visit is mandatory.

6.2 Where a date and time for a site visit is not set out in the Tender Particulars, the Tenderer is nevertheless advised to arrange with Sarawak Energy's Representative to visit and examine the site and its surroundings and obtain for itself all information that may be necessary for the preparation of a complete Tender Offer.

6.3 Not later than two (2) days prior to a site visit, the Tenderer shall inform Sarawak Energy's Representative of the persons that will be attending the site visit on its behalf.

6.4 The Tenderer may not carry out any site visit, examinations or tests without the prior written consent of Sarawak Energy's Representative.

6.5 In participating in any site visit, the Tenderer and its personnel or agents agree to release and indemnify Sarawak Energy (and its officers, directors, employees and

agents), from all liability for death or personal injury, loss of or damage to property or any other loss, damage, costs and expenses arising as a result of or in connection with the site visit.

7. Clarification of Tender Documents

7.1 Any Tenderer requiring clarification of any matter set out in the Tender Documents shall notify Sarawak Energy's Representative in writing not later than the date falling seven (7) days prior to the Closing Date and Time.

7.2 Sarawak Energy may, but is under no obligation to, respond to any request for clarification which it receives (and any such response shall be provided for information purposes only).

8. Issuing of addendum

At any time on or prior to the Closing Date and Time, Sarawak Energy may delete, remove or amend any part of the Tender Documents by issuing an addendum in writing.

9. Sarawak Energy's Representative

All correspondence and communications regarding this tender process, both prior to the Closing Date and Time and during the Tender Validity Period, shall be directed to Sarawak Energy's Representative (and any failure by the Tenderer to comply with this Clause 9 may result in a Tenderer being disqualified from this tender process or its Tender Offer being rejected).

10. Subcontracting

10.1 The Tenderer agrees, if it is selected as the successful Tenderer by Sarawak Energy, that it shall not, under any circumstances, subcontract the whole of the Works.

10.2 Without in any way limiting Clause 10.1, if a Tenderer is selected as the successful Tenderer by Sarawak Energy, it shall not, under any circumstances, subcontract any part of the Works without the prior written consent of Sarawak Energy (which may be withheld in its absolute discretion).

C. HEALTH, SAFETY AND ENVIRONMENT

11. Health, Safety and Environment

11.1 Tenderers acknowledge that they shall be required, during the performance of the Works, to:

- (a) establish and maintain the highest levels of health and safety consistent with best industry practice and to at all times take all reasonable precautions to maintain the health and safety of all of its personnel, other personnel involved in the Works and members of the public; and
- (b) take all necessary steps and reasonable precautions to protect the environment and to limit damage and nuisance to people and property resulting from pollution, noise and other results of its operations,

in compliance with all legislative requirements, the requirements of Government Authorities and the requirements of Sarawak Energy.

- 11.2 Tender Offers shall demonstrate the Tenderers' ability and commitment to meet the health, safety and environment requirements and Tenderers shall incorporate, as part of their Tender Price, all costs and expenses required to comply with their health and safety management obligations in connection with the performance of the Works.
- 11.3 Tenderers may, prior to the Closing Date and Time, obtain a copy of Sarawak Energy's policies on health, safety and environment from Sarawak Energy's Representative.

D. INFORMATION SECURITY MANAGEMENT SYSTEM

12. Information Security Management System

In carrying out the Works, the successful Tenderer may be required to comply with Sarawak Energy's information security management system ("ISMS") requirements as may be notified by Sarawak Energy to the successful Tenderer from time to time. Such requirements may include the vetting of those personnel required to work within identified restricted access zones across Sarawak Energy's generation, transmission and distribution assets, including any related IT networks and services. Subject to Sarawak Energy's specific ISMS requirements, the successful Tenderer may also be required to establish its own procedures and protocol with respect to the security of any third party software required to be installed within Sarawak Energy's network.

E. LOCAL PARTICIPATION

13. Support for Local Participation

- 13.1 Each Tender Offer shall be prepared on a basis that seeks to maximise the opportunity for the participation of Local Participation in connection with the performance of the Works and promotes the opportunity for knowledge transfer.

- 13.2 In preparing and submitting its Tender Offer, the Tenderer shall be required to identify and demonstrate how it intends to maximise the participation of Local Participation in connection with the performance of the Works.
- 13.3 Sarawak Energy reserves the right to request such further information or evidence from a Tenderer as it may reasonably require to ensure that the principles for supporting and promoting opportunity for the participation of Local Participation in the performance of the Works are complied with.
- 13.4 The successful Tenderer's commitments relating to the levels of participation of Local Participation shall constitute an enforceable contractual obligation under the Contract and the successful Tenderer shall be required to report such levels of participation and Sarawak Energy shall be entitled to continually monitor such activities during the performance of the Works.
- 13.5 For the purposes of this Clause 13:
- (a) the value of any goods, materials (including raw materials), labour, plant and equipment not originating from sources from within Malaysia; and
 - (b) any portion of the Works that is purportedly to be provided through the use of Local Participation but is subsequently further subcontracted to entities that do not constitute Local Participation,
- shall not be recognised or attributed by Sarawak Energy towards fulfilling the committed levels of participation of Local Participation.

F. CORPORATE SOCIAL RESPONSIBILITY

14. Corporate social responsibility initiatives

- 14.1 Tender Offers that display a commitment to corporate social responsibility, through good corporate citizenship, will be viewed favourably by Sarawak Energy.
- 14.2 Examples of initiatives encouraged by Sarawak Energy include sponsorships, charitable initiatives or general community services, which promote the following principles:
- (a) creation of economic opportunities for Sarawakians;
 - (b) investment in local communities;
 - (c) sustainability; and
 - (d) transparency and community engagement.

G. REQUIREMENTS OF TENDERERS**15. Scope of Tender Offer**

Tender Offers shall be submitted for the whole of the Works as set out in the Tender Documents.

16. Eligibility to tender

Only those Tenderers meeting the Eligibility Requirements are permitted to participate in this tender process.

17. Confidentiality obligations

17.1 Except as required by any applicable Laws, all Tender Documents, the tender process, the Tender Offer and any other information provided to the Tenderer by Sarawak Energy and any information regarding Sarawak Energy acquired by the Tenderer during the tender process shall be treated as confidential information, only to be used for the sole purposes of participating in this tender process and not disclosed to any third party.

17.2 The Tenderer shall ensure the safe and secure storage, management and handling of such information in order to protect against theft, damage, loss and unauthorised use, storage, copying or disclosure of such information and shall notify Sarawak Energy immediately if it suspects, or becomes aware of, any theft, damage, loss or unauthorised use, storage, copying or disclosure of such information.

17.3 Upon any request by Sarawak Energy, the Tenderer shall destroy or return to Sarawak Energy all such information.

18. Personal data

In submitting a Tender Offer, each Tenderer:

- (a) shall be deemed to provide explicit consent to Sarawak Energy to process any of the Tenderer's personal data for the purposes of, or related to, the request for quotation;
- (b) warrants that any personal data received from Sarawak Energy shall be processed; and
- (c) warrants that all personal data submitted by the Tenderer to Sarawak Energy has been obtained,

in accordance with the requirements of the Personal Data Protection Act 2010.

19. Corrupt practices

19.1 Sarawak Energy requires that all Tenderers observe the highest standard of ethical practices throughout the tender process and, in the case of the successful Tenderer, during the performance of the Works.

19.2 Sarawak Energy may, in its sole and absolute discretion:

- (a) reject a Tender Offer or, in the case of the successful Tenderer, immediately terminate any Contract; and
- (b) impose sanctions on a party (including a Tenderer, the successful Tenderer, or any other party), at any time, including declaring any such party ineligible, either indefinitely or for a stated period of time, from participating in any tender process conducted by Sarawak Energy,

if at any time Sarawak Energy determines that a Tenderer has, directly or indirectly through another party, engaged in corrupt, fraudulent, collusive, coercive or other prohibited practices.

H. PREPARATION OF TENDER OFFER

20. Cost of tendering

The Tenderer shall bear all costs associated with the preparation and submission of its Tender Offer, including requests for clarifications and the finalisation and execution of the Contract and Sarawak Energy shall in no case be responsible or liable for such costs, regardless of the conduct or the outcome of the tender process.

21. Language

All correspondence and communications given under or in connection with the Tender Documents and the tender process shall be in English.

22. Governing law and jurisdiction

22.1 The Tender Documents and this tender process are governed by the laws of Malaysia, as applicable in Sarawak.

22.2 The Courts of Sarawak shall have non-exclusive jurisdiction to settle any dispute arising out of or in connection with Tender Documents and the tender process.

23. Corporate Authorisation

- 23.1 Each Tenderer shall provide an appropriate Corporate Authorisation identifying and authorising the Authorised Signatory to do all other acts and things and sign or execute (under hand or under seal) and deliver any and all other documents and give any and all notices which may be required or which the Authorised Signatory, in its discretion, considers necessary in connection with the Tenderer's participation in the tender process, signing the Tender Offer and signing the Contract.
- 23.2 The Tenderer and / or the Authorised Signatory may delegate any of its rights, powers and functions (other than signing the Tender Offer and signing the Contract) of the Authorised Signatory to the Tenderer's Representative.
- 23.3 If a Tenderer is a Consortium Tenderer, each member of the Tenderer shall provide an appropriate Corporate Authorisation providing for the authorisation of the Authorised Signatory in respect of the matters referred to in Clause 23.1.
- 24. Tender Price**
- 24.1 The pricing method for the Tender Price (or each portion of the Tender Price) is as set out in the Tender Particulars.
- 24.2 Except as otherwise stated in this Clause 24 [*Tender Price*], the Tender Price shall be inclusive of all Taxes which may be applicable to the Works as set out in the Pricing Appendix and include any Disbursements (if any).
- 24.3 The Tender Price excludes:
- (a) any GST applicable to the Works on and from 1 April 2015 and Sarawak Energy shall be liable for the payment of any such GST in addition to the Tender Price; and
 - (b) any stamp duty payable in relation to the Works within Malaysia, and Sarawak Energy shall be liable to arrange and pay for all such duty.
- 24.4 The successful Tenderer shall warrant that:
- (a) from 1 April 2015, the Tender Price shall not include any amounts on account of Service Tax or Sales Tax;
 - (b) it shall not receive any net benefit as a result of the introduction of the Goods and Services Tax Act;
 - (c) it shall cooperate with any request made by Sarawak Energy, on a full "open book" and transparent basis, for the Tenderer to show that it is complying with the requirements of this Sub-Clause 24.4 and with a view to ensuring that

there is no double-counting of Services Tax, Sales Tax and GST charged to Sarawak Energy; and

- (d) Sarawak Energy shall be entitled to recover any amounts overpaid to the successful Tenderer as a result of the abolition of Service Tax and Sales Tax and the introduction of the Goods and Services Tax Act 2014.

24.5 Where the Goods and Services Tax Act 2014 is applicable to the Works, or any part of the Works, the successful Tenderer shall:

- (a) invoice Sarawak Energy any applicable GST as a separate and clearly identifiable line item within the relevant statement and invoice;
- (b) fully comply with the requirements of the Goods and Services Tax Act 2014 (including the requirements for the issuing of a valid tax invoice);
- (c) provide Sarawak Energy with suitable evidence of its registration with the relevant Government Authority in accordance with the requirements of the Goods and Services Tax Act 2014; and
- (d) otherwise do all acts and things necessary to assist Sarawak Energy to claim an input tax credit under the Goods and Services Tax Act 2014.

24.6 The Contractor acknowledges that it may be required to pay a levy to the Construction Industry Development Board in accordance with the Lembaga Pembangunan Industri Pembinaan Malaysia Act 1994 and the Construction Industry (Levy Collection) Regulations 1996, and, if requested by Sarawak Energy, shall provide evidence of the payment of such amounts.

25. **Currencies and cost fluctuations**

25.1 The Tender Price and all rates and the prices set out in the Pricing Appendix shall be quoted by the Tenderer in Ringgit. However, Tenderers based outside of Malaysia may submit their Tender Offer in foreign currencies. Notwithstanding this, all payments shall be made in Ringgit and shall be calculated based on the official exchange rate published by Bank Negara Malaysia as of the date of the Letter of Award.

25.2 On and from the Closing Date and Time, the Tenderer shall under no circumstances be permitted to amend its Tender Price and the Pricing Appendix, regardless of:

- (a) any change in any applicable Laws (including the introduction of any new Taxes);
- (b) any fluctuation in the foreign exchange rate;
- (c) any fluctuations in the cost of materials and / or labour; or

- (d) any other occurrence.

26. Tender Validity Period

- 26.1 A Tender Offer shall expressly specify that it shall remain open and valid for the Tender Validity Period.
- 26.2 Notwithstanding that any Tenderer has been notified that it is not a successful Tenderer, each Tenderer's Tender Offer shall remain valid for the Tender Validity Period.

27. Conflict of interest

- 27.1 Each Tender Offer shall include a declaration (in the prescribed form set out in Part II, Section 2 of the Tender Documents) of the nature and extent of, any conflict of interest that may exist or arise in relation to this tender process and the Tenderer shall submit, as part of its Tender Offer, proposals for avoiding any such conflicts of interest.
- 27.2 A failure by a Tenderer to adhere to the requirements of this Clause 27 may, in Sarawak Energy's sole and absolute discretion, result in a Tenderer being disqualified from the tender process or its Tender Offer being rejected.

28. Tender Security

- 28.1 A Tender Offer shall be accompanied by a Tender Security (also known as a bid bond or a bid security) issued to Sarawak Energy on the date the Tender Offer is submitted if required by the Tender Particulars. Failure by a Tenderer to include the Tender Security may, in Sarawak Energy's sole and absolute discretion, result in a Tenderer being disqualified from the tender process or its Tender Offer being rejected.
- 28.2 The Tender Security may be provided, at the Tenderer's option, in any of the following forms:
 - (a) an unconditional bank guarantee in the form set out in the Appendix to these Instructions to Tenderers, or such other form confirmed in writing as being acceptable to Sarawak Energy;
 - (b) an irrevocable letter of credit; or
 - (c) cash, bank draft, cashier's cheque or certified cheque made payable to Sarawak Energy,

and shall be issued by a bank which is registered, and which has offices, in Malaysia (and which is otherwise acceptable to Sarawak Energy).

28.3 The Tender Security may be forfeited, if:

- (a) the Tenderer withdraws its Tender Offer during the Tender Validity Period;
- (b) the successful Tenderer fails:
 - (i) to sign the Contract in accordance with Clause 38; or
 - (ii) furnish any required performance security in accordance with the Contract; or
 - (iii) in Sarawak Energy's reasonable opinion, the Tenderer has in any other way breached a material aspect of this tender process.

28.4 Where the Tender Security includes an expiry date, such expiry date shall be not earlier than one hundred and eight (180) days after the date of expiry of the Tender Validity Period.

28.5 If it becomes necessary to extend the Tender Validity Period and / or the validity period of the Tender Security, Sarawak Energy may request (in writing) the Tenderer for extension of such validity period before the expiry date.

28.6 The Tenderer shall have the right to refuse to grant an extension, in accordance with Clause 28.5, without forfeiting the Tender Security and the:

- (a) Tender Security of any Tenderer who refuses to grant such extension shall be returned; and
- (b) Tenderer shall be deemed to have waived the right to further participate in the tender process.

29. **Securities and Guarantees**

The successful Tenderer shall, within twenty-eight (28) days after the date of the Letter of Award, obtain (at its cost) and deliver the performance bond, and where required by the Contract Agreement, the parent company guarantee and director personal guarantee(s), to Sarawak Energy in accordance with requirements set out in the Form of Contract.

30. **Insurance policies**

The successful Tenderer shall, within seven (7) days after the date of the Letter of Award, provide satisfactory evidence to Sarawak Energy that the insurance policies required under the Form of Contract have been effected and are being maintained by the Tenderer.

I. SUBMISSION AND OPENING OF TENDER OFFERS**31. Format and signing of Tender Offer**

31.1 Tender Offers shall be submitted in the number of signed original hard copies and photocopies of such signed original as set out in the Tender Particulars.

31.2 The Tender Offer shall be in writing and be signed by the Authorised Signatory.

31.3 All corrections to the signed original hard copies of the Tender Offer must be made clearly in writing, and must be signed and stamped by the Authorised Signatory. The Tenderer may not use liquid paper or correction tape in making corrections.

32. Sealing and marking of Tender Offers

32.1 The Tenderer shall prepare and enclose the hard copies of its Tender Offer in two (2) separate sealed envelopes, duly marking the envelopes as:

- (a) "TECHNICAL" for the envelope containing technical and specifications-related matters; and
- (b) "COMMERCIAL" for the envelope containing commercial, pricing or financial-related information.

32.2 The two (2) envelopes shall then be secured as one package. Both envelopes shall:

- (a) identify the Tenderer to enable the Tender Offer to be returned unopened in the event this is required;
- (b) be addressed to Sarawak Energy's address for submission of tenders in accordance with the matters set out in the Tender Particulars; and
- (c) bear the following in bold letters:

**TENDER FOR AERIAL SCANNING AND INSPECTION
FOR 132/275KV TRANSMISSION LINES
TENDER DOCUMENTS
(SARAWAK ENERGY REF. No. 210103ASI/15)**

32.3 To the extent that any ambiguity, conflict, discrepancy or inconsistency is found to arise between the hard and soft copies of the Tender Offer, the contents of the original hard copy shall prevail to the extent of such ambiguity, conflict, discrepancy or inconsistency.

33. Closing Date and Time

- 33.1 Tender Offers shall be received by Sarawak Energy at the address set out in the Tender Particulars and by no later than the Closing Date and Time.
- 33.2 Any Tender Offer received by Sarawak Energy after the Closing Date and Time may be declared late, rejected by Sarawak Energy and returned unopened to the Tenderer.

J. EVALUATION OF TENDER OFFERS

34. Evaluation of Tender Offers

- (a) Sarawak Energy's evaluation of the Tender Offers shall be carried out in accordance with Sarawak Energy's internal policy and requirements having regard to, among other things:
- (i) the completeness and responsiveness of the Tender Offer;
 - (ii) the Tender Price and the rates and prices set out in the Pricing Appendix; and
 - (iii) such other information as Sarawak Energy considers relevant to the evaluation and assessment of each Tenderer's Tender Offer.
- (b) Following the evaluation of each Tender Offer, Sarawak Energy will compare all substantially responsive Tender Offers to determine the Tender Offer that represents the best value to Sarawak Energy.

35. Clarification of Tender Offers

To assist in the evaluation, and comparison of Tender Offers, Sarawak Energy may (but is in no way obliged to) request a Tenderer to clarify certain aspects of its Tender Offer.

36. Sarawak Energy's rights

36.1 Sarawak Energy is not obliged to:

- (a) consider or evaluate any Tender Offer; or
- (b) award the Contract to the Tenderer submitting the lowest Tender Price or accept any Tender Offer,

and reserves the right to accept, reject or disqualify any Tender Offer, or to cancel the tender process at any time without any obligation or incurring any liability to any Tenderer.

- 36.2 Sarawak Energy's rights in accordance with Clause 36.1 shall apply at any and all times during the tender process, notwithstanding that any Tenderer(s) may have been notified as a successful or preferred Tenderer.
- 36.3 Sarawak Energy in its sole and absolute discretion may (but is not obliged to) permit any non-compliance by any Tenderer with any aspect of this tender process without any obligation or incurring any liability to any Tenderer.
- 36.4 Notwithstanding any other provision of these Instructions to Tenderers to the contrary, Sarawak Energy (and its officers, directors, employees and agents) shall not, under any circumstances, whether as a result of breach of contract, indemnity, tort (including negligence), strict liability or otherwise, be liable to any Tenderer for any loss of profit, loss of revenues, loss of use of equipment, loss of chance or opportunity, loss of contract, cost of capital or for any indirect or consequential loss or damage which may be suffered by the Tenderer, as a result of or in connection with this tender process.
- 36.5 Sarawak Energy may, in its absolute discretion, impose sanctions against a Tenderer for any failure to comply with any of the requirements of this tender process (including as set out in these Instructions to Tenderers), including the:
- (a) imposition of a penalty or handicap against such Tenderer in relation to this tender process and / or any future procurement exercises of Sarawak Energy; and
 - (b) disqualification of such Tenderer from participation in this tender process and / or any future procurement exercises of Sarawak Energy.

K. AWARD OF CONTRACT

37. Contract award

- 37.1 Prior to the expiration of the Tender Validity Period, Sarawak Energy may issue a Letter of Award to the successful Tenderer, which shall specify the terms and conditions on which the successful Tenderer is awarded the Contract for the Works.
- 37.2 Within seven (7) days (or such later date as Sarawak Energy may in its reasonable discretion require) of receipt of a Letter of Award, the successful Tenderer shall duly execute and sign the acknowledgment to the Letter of Award, and return it to Sarawak Energy.
- 37.3 Until such time as a formal Contract is prepared and executed, the Letter of Award shall constitute a binding contract between Sarawak Energy and the successful Tenderer for the Works on the terms and conditions set out in such Letter of Award.

37.4 Failure to execute and sign the acknowledgment of its agreement to the terms and conditions set out in the Letter of Award or the Contract within the timeline set out in these Instructions to Tenderers may result in the Tenderer's disqualification from the tender process (and its pre-existing status as the successful Tenderer being null and void), its Tender Offer being rejected and the Letter of Award being null and void and Sarawak Energy reserves the right to award the tender to alternative Tenderers (including those that Sarawak Energy has notified that their Tender Offer has not been successful), in which case this Clause 37 and Clause 38 shall apply to that Tenderer.

38. Signing of Contract

38.1 Following the issuance of the Letter of Award, Sarawak Energy will compile all documents comprising the Contract prior to sending these documents to the successful Tenderer for signature.

38.2 Within seven (7) days of receipt of the finalised Contract (or such later date as may be required by Sarawak Energy), the successful Tenderer shall duly execute and sign the Contract and return it to Sarawak Energy.

APPENDIX – FORM OF TENDER SECURITY

Sarawak Energy Berhad (007199-D) ("**Sarawak Energy**") has invited the submission of tender offers for the performance of **Tender for Aerial Scanning and Inspection for 132/275kV Transmission Lines**.

[Insert name of Tenderer or, in the case of a Consortium Tenderer, insert names of all members of the Consortium Tenderer], being a company properly incorporated under the laws of *[insert the place of incorporation of Tenderer, or, in the case of a Consortium Tenderer, insert the place of incorporation of all members of the Consortium Tenderer]* and with its registered office situated at *[insert registered office details of Tenderer, or, in the case of a Consortium Tenderer, insert registered office details of all members of the Consortium Tenderer]* (the "**Tenderer**") has submitted a tender offer, dated *[insert date]*, in connection with the performance of **Tender for Aerial Scanning and Inspection for 132kV/275kV Transmission Lines**, for consideration by Sarawak Energy.

We, *[insert name of Surety]*, being a bank registered and having offices within Malaysia and whose registered office is situated at *[insert registered office details of Surety]* (the "**Surety**") irrevocably and unconditionally bind ourselves to Sarawak Energy under this guarantee (the "**Guarantee**") as follows:

1. We undertake to pay Sarawak Energy, without any objection or proof of condition whatsoever, a sum or sums not exceeding RM*[insert amount]* in aggregate (the "**Secured Sum**").
2. We shall be required to pay to Sarawak Energy the Secured Sum (or such lesser amount as may be demanded by Sarawak Energy) immediately upon receipt of a written demand from Sarawak Energy, addressed to us and sent by hand or by registered post to *[insert address of Surety's notification office within Malaysia]*, stating that, in Sarawak Energy's reasonable discretion, the Tenderer has breached a material obligation, which it has assumed in connection with the tender process.
3. We agree that receipt of the written demand referred to in paragraph 2 shall be conclusive evidence of the amount which we are liable to pay to Sarawak Energy.
4. We agree that our obligations set out in this Guarantee are direct, primary and irrevocable obligations and payment of the Secured Sum shall be made:
 - (a) without any reference to the Tenderer;
 - (b) without any proof or conditions;

- (c) irrespective of any notice or other instruction, which has been given by the Tenderer to us not to pay the Secured Sum (either in whole or in part) to Sarawak Energy; and
 - (d) irrespective of the performance or non-performance of any obligations, by either the Tenderer or Sarawak Energy.
- 5. We agree that Sarawak Energy shall not be required or obliged to exercise any other right or remedy which it may have, including, without limitation, taking legal action against the Tenderer, before making any demand on this Guarantee.
- 6. We agree that payment of any sum or sums by us, in accordance with this Guarantee, shall be made without any set-off, abatement, withholding, deduction or counterclaim whatsoever.
- 7. We agree that Sarawak Energy may make any number of demands under this Guarantee.
- 8. Other than following the:
 - (a) performance of all of our obligations under this Guarantee; or
 - (b) expiration of this Guarantee, in accordance with paragraph 9,

we shall not be discharged or released from all or any part of our obligations in accordance with this Guarantee, for any reason or cause whatsoever, including, without limitation, as a result of any arrangement between the Tenderer and Sarawak Energy with or without our consent and/or knowledge, by any alteration in the obligations undertaken by the Tenderer or by any forbearance, whether as to payment, time, performance or otherwise.
- 9. This Guarantee is a continuing guarantee and shall be valid until [*insert a date that is not less than sixty (60) days after the date of expiry of the Tender Validity Period*].
- 10. This Guarantee is governed by and shall be constructed in accordance with the laws of Malaysia, as applicable in the State of Sarawak, for the time being in force and the Surety and Sarawak Energy agree to submit to the non-exclusive jurisdiction of the courts of the State of Sarawak, Malaysia.

Dated thisday of 20

This Guarantee is executed as follows.

Signed for and on behalf of **[INSERT NAME OF THE SURETY]** by its authorised representative in the presence of:

Signature of authorised representative

Name and designation of authorised representative

Company stamp

Signature of witness

Name and designation of witness