Republic of the Philippines
NUEVA ECIJA UNIVERSITY OF SCIENCE AND TECHNOLOGY
Cabanatuan City
044-463-0226 / www.neust.edu.ph

INVITATION TO BID

The Nueva Ecija University of Science and Technology through its Bids and Awards Committee (BAC), Invites entities to apply for eligibility and to bid for the hereunder project:

Name of Project: **Electrical Power System Laboratory**
Approved Budget for the Contract (ABC): Php 24,950,000.00
Contract Duration: 120 DAYS
Fund Source: INCOME
Bid Documents: 25,000.00

Schedule of Activities:

Deadline of Submission of Letter of Intent LOI: OCTOBER 30, 2019, 5:00 PM
Pre-Bid Conference: NOVEMBER 4, 2019, 9:00 AM
Submission of Bids: NOVEMBER 18, 2019, UNTIL 5:00 PM
Opening of Bid: NOVEMBER 19, 2019, 9:00 AM
Post Qualification: NOVEMBER 20, 2019 9:00 AM

ITEM DESCRIPTION:

1	**unit**	**Transmission Line Simulator includes**
		Power Factor Load Bank
		Learning Outcomes Single-phase line:
		• Short-line investigation
		• Medium or long-line investigation (nominal
		'Tee' and 'Pi' methods)
		• Effect of power and reactive power flow on
		voltage drop and transmission angle
		• Medium/long-line investigation of a natural
		load of a line
		• Voltage regulation at constant load and
		power factor
		Three-phase lines:
		• Per-unit values
		• Unbalanced loads and the neutral connection
		• Fault simulation and line protection studies
		• Parallel feeders and multi-section lines • Parallel feeders and multi-section lines
		Key Features:
		• Fault application switch and earth fault
		resistors allow studies of earth fault currents
		and the operation of relays of varying
		sensitivity
		• Enables 'Pi' or 'Tee' methods of loss profiling
		• Single and three-phase lines for separate
		tests
		• Built-in industrial-standard digital protection
		relay gives wide range of functions – module

		includes extra socket for additional relay to
		give more experiments
		• Includes supplies, circuit protection, internal
		load banks, instruments and controls
		Key Specifications
		• Single-phase and three-phase lines
		• Six-section three-phase line
		• Resistive, inductive and capacitive loads
		• Overcurrent protection relay
		The console is divided into two panels, each
		with detailed mimic diagrams. The upper
		panel has a single phase transmission line
		equivalent circuit, and the lower panel a three-
		phase transmission line. The lines may be
		loaded by the resistive, capacitative and
		inductive loads included. The effects can be
		monitored by instruments at the send and
		receive ends of the transmission lines
		The single-phase transmission line includes a
		set of inductive impedances connected in
		series. Tapping points allow the user to:
		• change the length of the simulated line;
		• set up 'Pi' or 'Tee' methods of loss profiling
		using different values of capacitance; and
		• monitor the voltage, current and power at
		any point along the line
		The three-phase transmission line is in six
		sections represented in 'per-unit' values.
		Facilities include:
		• Operating under variable balanced or
		unbalanced RLC (resistive, inductive and
		capacitative) loads
		• Selectable neutral
		• Provision to vary the length parameters
		A fault application switch and earth fault
		resistors allow studies of earth fault currents
		and the operation of relays of varying
		sensitivity.
		For protection tests, current transformers (CTs)
		in the test circuits connect to the protection
		relay fitted to the control panel.
		The user connects and sets the protection relay
		to detect line and eareth currents. The relay
		also monitors and measures fault events and
		disturbances for fault analysis. The user sets
		the relay from its local control panel or by a
		cable link to a suitable computer and software
		(included). When a circuit fault happens, the
		relay opens circuit-breakers in the test circuits.
		The circuit breakers also include hand-operated
		switches, and lamps. The lamps show whether

		the circuit-breakers are open or closed.
		Line simulation: Inductors, with three-phase
		line represented in per-unit values
		Three-phase lines: Five sections, each at 0.15
		p.u. value: 75 km of 132 kV line on a 100 MVA
		base. One section at 0.25 p.u. value: 125 km of
		132 kV line on a 100 MVA base
		Three-phase load banks: Resistive, inductive
		and capacitative
		Other controls and instrumentation:
		•Phase angle meter for single-phase and
		three-phase
		• Fault switch
		• Single-phase and three-phase selectable
		capacitor banks for p and T networks
		•Switchable neutral from transformer secon-
		dary Protection relay: Overcurrent relay
1	**Unit**	**Power Factor Load Bank**
		•Phase power factors independently adjustable
		from leading to lagging
		•Phase loads independently adjustable
		•Maintains the power factor even when the
		load is adjusted
		•For use with single and three-phase circuits
		•For usa as a three-phase star or delta-
		connected load
		•Mobile unit for ease of use
		•Self-contained, needs no external power
		•Coloured, shrouded sockets for increased
		safety
		•Creates balanced and unbalanced loads on
		three-phase circuits
		The Power Factor Load Bank is a free-standing
		and mobile unit. It gives predictable load and
		power factor characteristics, useful for many
		different power system experiments. It also
		helps to show the principles of a static VAr
		compensator used in industrial plants and large
		factories
		The load bank provides three separate inputs:
		Lines 1,2 and 3. This allows it to work with
		single and three-phase circuits. Each line is
		independent, which allows it to connect with
		the others as a star or delta load.
		The load bank includes three separate banks of
		resistive, inductive and capacitative loads.
		They give a choice and combination of types of
		loads to give unity (resistive only) and leading
		or lagging power factor. A voltage-selector

		switch allows the load bank to work with
		different line voltages for single and three-
		phase circuits. Each bank (line) may be set to
		different values, to give an unbalanced load
		for balanced and unbalanced load tests.
		Loads: Three separate variable loads at 1kVA
		(3kVA total for three-phase)
		Power factors:
		•Unity, 0.8, 0.6, 0.4 and low* lagging
		•Unity, 0.8, 0.6, 0.4 and low* leading * Low is
		approximately 0.2 pf but varies slightly due to
		component tolerances
1	**Unit**	**Feeder Management Relay**
		The main function of the Feeder Management
		Relay include:
		•Four independent stages of directional/non-
		directional overcurrent (ANSI 50, ANSI 51, ANSI
		67). The first two stages may be independently
		set to any of ten IDMT curves, the remaining
		two stages having a direct time characteristic
		•Directional/non-directional earth fault (ANSI
		50N, ANSI 51N, ANSI67N)
		•Sensitive directional/non-directional earth
		fault
		•Wattmetric earth fault(ANSI 32N)
		•Sensitive directional earth fault
		•Restricted earth fault (ANSI 64N)
		•Directional/non-directional negative sequence
		overcurrent (ANSI 46, ANSI 67)
		•Thermal overload protection (ANSI 49)
		•Under and overvoltage (ANSI 27, ANSI 59)
		•Residual overvoltage (ANSI 59N)
		•Negative sequence overvoltage (ANSI 47)
		•Under and over frequency
		•Broken conductor
		•Selectable blocking
		•Creating fault and disturbance records
1	**Unit**	**Overcurrent and earth fault relay**
		The main functions of the Overcurrent and
		Earth Fault Relay include:
		•Three-phase earth and overcurrent: three
		independent stages. The first stage selectable
		from any of 12 IDMT curve; the remaining
		stages having a direct time characteristic (ANSI
		50/51 and ANSI 50N/51N)
		•High impedance restricted earth fault (ANSI
		64N)
		•Thermal overload protection (ANSI 49)

		•Undercurrent (ANSI 37)
		•Negative-phase sequence overcurrent: two
		independent stages (ANSi 46)
		•Broken conductor detection (ANSI 46BC)
		•Selectable blocking
		•Trend, fault and disturbance records
		•Circuit monitoring
6	**Set**	**MULTIPURPOSE WORKSTATION FOR**
		STUDENT BENCHES WITH POWER CONSOLE
		+ EMERGENCY STOP PUSH BUTTON
		DIMENSIONS: 1800*750mm
		•6 power sockets + 1 circuit breaker + 1
		indicator light. + 1 emergency stop pushbutton
		•High temperature stratified top 40mm. Max
		load 1000kg uniformly distributed.
		•A PVC protective pad is placed underneath
		each foot.
		•Height of the bench top included 840mm.
		Total height 960mm.
		Rear section of insulated terminals (TT earth-
		ing system)
		As the standard dictates, all the electrical
		connections of insulated mains output, for
		example DC, are completely sheathed to
		ensure the separation of circuits.
		Positive safety and activation
		Following a network outage, the station will
		not automatically restart when the mains is
		restored. It will require an operator action.
		Manual restart required.
		Resistant LED indicator lights cannot be
		removed by the student (the front cap cannot
		be unscrewed). No risk of accidental contact
		for the maintenance operator.
		Anti-vandalism emergency stop push-button
		The crown of the Emergency Stop push-button
		can turn freely. As a result, the vandal cannot
		any more tear off the electrical connections by
		turning in strength the head of the Emergency
		Stop. The device stays in position on the
		front panel without any risk of damage.

Requirements:

1. On-site installation and testing.
2. Five (5) days rigid training for faculty and laboratory technicians.
3. Bidder must submit Credit Line Certificate issued by a reputable Bank equivalent to 100% of the Approved Budget for the Contract (ABC).
4. Bidder should submit after sales service certificate from previously completed projects (minimum of at least 10 from various client from year 2010 to present.)

a.) The BAC will use non-discretionary pass/fail criteria in the Eligibility Check /Screening as well as the Preliminary Examination of Bids. The BAC will conduct post qualification of the lowest calculated bid.
b.) All particulars to the Eligibility Statement and Screening, Bid Security, Performance Security, Pre-Bidding Conference, Evaluation of Bids, Post Qualification and Award of Contract shall be governed by the pertinent provisions of R.A. 9184 and its Implementing Rules and Regulations (IRR).
c.) The BAC will issue to prospective bidders Eligibility Forms at the Office of the BAC Chairman, Nueva Ecija University of Science and Technology (NEUST), Cabanatuan City upon their submission of a Letter of Intent (LOI) to the Nueva Ecija University of Science and Technology. Prospective bidders shall submit the Eligibility Requirements to the BAC at the said address.
d.) The BAC will issue Bidding Documents to prospective entities upon payment of non-refundable amount of Php 25, 000.00 to the Nueva Ecija University of Science and Technology (NEUST) Cashier's Office.
e.) The Nueva Ecija University of Science and Technology (NEUST) reserves the right to accept or reject any Bid or to annul the bidding process, and to reject all Bids at any time prior to contract award, whether thereby incurring any liability to the affected bidder or bidders.

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