ABmerit – nuclear science and software

SOFTWARE ENGINEERING, AUTHOR OF COMPUTER CODES **ESTE**
TECHNICAL SUPPORT ORGANIZATION
ENVIRONMENTAL IMPACT ASSESSMENT ANALYSES AND SAFETY REPORTS
RADIATION SAFETY AND DOSIMETRY, ARCHITECT OF EMERGENCY RESPONSE SYSTEMS
R & D ORGANIZATION ACCREDITED BY SLOVAK MINISTRY OF EDUCATION, SCIENCE AND RESEARCH

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(Draft) Commercial Quotation to the IAEA

Advanced training of SW tools **ESTE** for Bushehr NPP/Iran: **"Integrated Software for Assessment and Management of Radiological Impacts"**, delivered to the IAEA in frame of the project No.201713073-VC.

Content of commercial quotation:

1) **Advanced training** on the use of ESTE systems, and on algorithms and methodologies of ESTE systems, performed **remotely, online**

2) Solution of potential issues and problems regarding the ESTE systems running at Bushehr NPP, which will arise or will be presented by counterpart during the advanced training: **Implementation of modifications (updates)** of ESTE systems running at Bushehr NPP, as a result of solution of issues presented and discussed during the advanced training. These issues can be connected especially with format of input/output data, new data available, new measurements, various findings of counterpart as a result of long term operation of ESTE systems at Bushehr NPP.

We suppose to perform advanced training remotely with utilization of webinar resources of the IAEA, as a set of 12 meetings sessions during 2-3 weeks, approx. 2 hours per training session, with utilization of the IAEA resources for remotely organized meetings.

Counterparts will use their own installations of ESTE systems during the training.

We will use the same versions of ESTE systems like are implemented and running in Iran, on our computers in our office, during the training sessions.

From the IAEA there is expected: Providing access to the resources for remotely organized meetings/webinars, and general organization of advanced training meetings sessions, via webex or other AV conference tool defined by the IAEA.

1) **Advanced training** on the use of ESTE Annual Impacts and on the use of ESTE Bushehr, and on algorithms and methodologies of both ESTE systems, performed remotely, online, via the webex of the IAEA (or other AV tool of the IAEA)

Session	**Description**	**Manpower of the contractor**
	Advanced training on the use of **ESTE Annual Impacts** and on the use of **ESTE Bushehr.** Duration of the advanced training course will be 12 training sessions during up to three calendar weeks, on line, two hours per one training session	**Total: = 292 h**
	Preparation for advanced training	80 h
1	General introduction of the SW **ESTE Annual Impacts** as was delivered to Iran in 2018. SW tool **ESTE Annual Impacts** for calculation of radiological impacts to inhabitants due to routine discharges (atmospheric and liquid). Scheme of implementation at the premises of the End-User. Short overview of basic functions of the SW delivered. Short overview of input data needed for calculations. General introduction of the SW **ESTE Bushehr** as was delivered to Iran in 2018. SW tool **ESTE Bushehr** is Decision Support System (DSS) for the crisis staff of Bushehr NPP. Scheme of implementation at the premises of the End-User, as real-time, 24/7 running DSS. Short overview of basic functions of the SW delivered. Short overview of input data in real time and simulation (scenario) mode.	8 h
	Resume of the training session, preparation of the response to the specific questions or issues presented by counterpart during training session	6 h
2	**ESTE Annual Impacts (routine discharges):** Conceptual model, exposure pathways assumed by version implemented at Bushehr NPP. Representative person – definition, specific behaviors applied in case of BNPP. Discussion. Task for homework.	8 h
	Resume of the training session, preparation of the response to the specific questions or issues presented by counterpart during training session	6 h
3	Discussion of results of calculations and tasks performed by participants after the Session 2. **ESTE Annual Impacts (routine discharges):** Dispersion model for airborne discharges. Dispersion model for marine environment (liquid discharges). Discussion. Task for homework.	8 h
	Resume of the training session, preparation of the response to the specific questions or issues presented by counterpart during training session	6 h
4	Discussion of results of calculations and tasks performed by participants after the Session 3.	8 h

Session	**Description**	**Manpower of the contractor**
	ESTE Annual Impacts (routine discharges): Input data inevitable to make calculations of impacts: Content and format of data. Libraries of conversion factors, transfer factors and other parameters of the SW. How to modify or update libraries. Discussion. Task for homework.	
	Resume of the training session, preparation of the response to the specific questions or issues presented by counterpart during training session	6 h
5	Discussion of results of calculations and tasks performed by participants after the Session 4. **Exercise** (resume) – participants use SW ESTE Annual Impacts (routine discharges): run the calculation (input data), work with results, and interpret the results. Running of exercise supervised by specialists of the Contractor. Discussion.	8 h
	Resume of the training session, preparation of the response to the specific questions or issues presented by counterpart during training session	6 h
6	**ESTE Bushehr (accidents):** Description of the GUI (graphical user interface), working with maps, tables, graphs, how to switch English/Russian language version, how to use archive, etc., overview of GUI functions available. Conceptual model, how does the program run, what are the most important algorithms applied, from symptoms of initiating event up to urgent protective measures recommended. Discussion. Task for homework.	8 h
	Resume of the training session, preparation of the response to the specific questions or issues presented by counterpart during training session	6 h
7	Discussion of results of calculations and tasks performed by participants after the Session 6. **ESTE Bushehr (accidents):** Initiating events are considered. Symptoms of release pathways considered. Symptoms of the state of the core/state of spent fuel pool considered. Symptoms of the state of containment considered. Discussion. Task for homework.	8 h
	Resume of the training session, preparation of the response to the specific questions or issues presented by counterpart during training session	6 h
8	Discussion of results of calculations and tasks performed by participants after the Session 7. **ESTE Bushehr (accidents):** Database of pre-calculated predicted source terms implemented in the program. How is pre-calculated source term assimilated to really observed symptoms and conditions. Discussion. Task for homework.	8 h
	Resume of the training session, preparation of the response to the specific questions or issues presented by counterpart during training session	6 h
9	Discussion of results of calculations and tasks performed by participants after the Session 8.	8 h

Session	**Description**	**Manpower of the contractor**
	ESTE Bushehr (accidents): Models for radiological impacts. Dispersion models implemented – description, input data. Ingestion models implemented. How are specific intervention levels for specific urgent protective measures evaluated. Discussion. Task for homework.	
	Resume of the training session, preparation of the response to the specific questions or issues presented by counterpart during training session	6 h
10	Discussion of results of calculations and tasks performed by participants after the Session 9. **ESTE Bushehr (accidents):** Description of meteorological data applied. How to use the SW in simulation (scenario) mode. Short practice of specific tasks – demonstration by specialists of the Contractor. Discussion. Task for homework.	8 h
	Resume of the training session, preparation of the response to the specific questions or issues presented by counterpart during training session	6 h
11	Discussion of results of calculations and tasks performed by participants after the Session 10. **Exercise** – participants should play their roles as crisis staff members and use SW "ESTE Bushehr" as decision support system. Running of exercise supervised by specialists of the Contractor. Discussion.	8 h
	Resume of the training session, preparation of the response to the specific questions or issues presented by counterpart during training session	6 h
12	Discussion and resume of the training course. Gathering and resuming of participants notes and proposals regarding the ESTE codes implemented in Iran. Certificates on successful completion of the training course.	8 h
	Resume of the training course, preparation of the response to the specific questions or issues presented by the counterpart. Preparation of the Contractor´s feedback to the IAEA.	50 h

2) **Modifications (updates)** of ESTE Annual Impacts (routine discharges) and ESTE Bushehr (accidents) running at Bushehr NPP, as a result of solution of issues presented and discussed during the advanced training.

Solution of potential issues and problems regarding the ESTE systems running at Bushehr NPP, which will arise or will be presented by counterpart during the advanced training: These issues can be connected especially with format of input/output data, new data available, new measurements, various findings of counterpart as a result of long term operation of ESTE systems at Bushehr NPP.

Manpower of the contractor allocated: up to 400 hours

3) Total manpower and the cost proposed:

	Rate	Manpower	Cost
1) Advanced training	140.00 EUR/h	292 hours	40 880.00 EUR
2) Modifications (updates)	120.00 EUR/h	up to 400 hours	up to 48 000.00 EUR
Total:			up to 88 880.00 EUR