



Jan 16<sup>th</sup>, 2019

## To Whom It May Concern

Limited Tender for fire suppression system

This is an RFQ (Request for Quote) for supply, installation, commissioning and testing of utility fire suppression system as part of a limited tender for the Centre for Nano Science and Engineering (CeNSE.) at IISc., Bangalore.

CeNSE is a multidisciplinary research department at IISc that houses a 14,000 sq. ft. cleanroom and characterization facility used by 50 faculty members from various disciplines at IISc. CeNSE is also a user-facility which has hosted over 6000 participants from more than 700 universities and institutes all over the world. Consequently, any tool in CeNSE receives significant exposure to scientific community in India and beyond. The vendors are requested to factor in the value of this exposure in to their quotes.

Being a user-facility which is operational 24x7, we needs systems with high efficiency, easily serviceable and maintained with minimum discomfort to the user population for the foreseeable future (at least 5 years), and has a track record of reliability at comparable facilities in India and abroad. Details of existing facilities and the user program can be gleaned from:

<http://nnfc.cense.iisc.ac.in/>

<http://www.mncf.cense.iisc.ac.in/>

<https://www.inup.cense.iisc.ac.in/>

1. Vendors will be required to submit a technical proposal and a commercial proposal in **two separate sealed envelopes**. Quotes in violation of this will be rejected.
2. **The deadline for submission of proposals is the 22<sup>nd</sup> of January 2019, 5:00 pm Indian Standard Time**. Proposals should arrive at the Main office, GF-15, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India, on or before the above deadline.
3. The decision of the purchase committee is final.
4. The technical proposal should contain
  - a. Relevant technical datasheets. The committee reserves the right to cross-check the information in these datasheets with publicly available information.
  - b. A compliance table with 5 columns. The first column must list the technical requirement, in the order that they are given in the technical configuration below. The second column should describe the capability of the system for that specific requirement. In case the technical requirement is a question, second column must provide a technical answer. Please be quantitative and consistent with the technical datasheets. Third column must specify whether the technical requirement is met with a "Yes", "No", or "Partially". If the response is "Partially" or "No" the third column, the fourth column must explain the extent of the deviation and, if possible, the reasons for the deviation. The fifth column is for other "Remarks". You can use it to compare your system with that of your competitors or provide more details/justifications.
  - c. Technical capabilities of any *suggested* accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the system. Vendors are encouraged to quote for as many add-ons as their system portfolio permits.



- d. Any additional capabilities or technical details, that you would like to bring to the attention of the purchase committee. Vendors are encouraged to highlight the advantages of their systems over comparable tools from the competitors
5. The technical proposal will be evaluated against the technical requirement. Only vendors who meet the technical requirement will be considered for the commercial negotiation.
6. If multiple systems fulfill the requirements, vendors can offer multiple bids.
7. The commercial bid must contain:
  - a. Itemized cost of the system and *required* accessories, such as software, power supply, etc.
  - b. itemized cost, as an option, for any *suggested* accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the system. Vendors are encouraged to quote for as many add-ons as their system portfolio permits.
  - c. The quotes should be CIF Bangalore, India. So please include cost of shipping to Bangalore. The quote does not need to account for Customs duties.
  - d. Please indicate the warranty provided with the system. Warranty of 3 years or more is preferred.
  - e. Provide itemized cost for *required/expected* spares for 3 years of operation. This number will be used to estimate the life cycle cost of the system.
  - f. The cost of annual maintenance contract (AMC). The details of AMC are given below. This number will be used to estimate the life cycle cost of the system.
  - g. Length of time that the systems will be supported with service and spares from the date of installation. Our requirement is that the systems be supported for at least 5 years from the date of installation. To quote lowest price, vendors often quote for obsolete or soon-to-be obsolete system. This is **NOT** acceptable. For a user-facility like CeNSE, it is vital that the equipment be serviceable and supported for the foreseeable future. The length of guaranteed support will be used to estimate the life-cycles cost of the system.
8. The AMC, valid for 3 years, must
  - a. cover 1 scheduled and 1 emergency visit per year;
  - b. the emergency visit should be supported with a 24-hour response window.
  - c. In case the OEM is foreign, clarify if maintenance will be done by a trained local engineer (OEM representative within India) or a specialist from abroad.
  - d. include in the commercial offer, an itemized list of spares (e.g. maintenance kits) that are essential for scheduled visits.
9. The commercial bids will be evaluated based on life-cycle cost of the system. This includes the cost of purchase, maintenance, spares, etc.
10. The RFQ must include references of 3 previous installations, preferably in India. Please provide the names and contact addresses of the referees, so that the committee can contact them independently.
11. We encourage vendors to give technical presentations, physically or over Skype, so that we can better understand the technical capabilities of their systems and vendors can better understand the requirements. To schedule the presentations, the vendors can contact Dr. Savitha P, GF-20, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. ([savithap@iisc.ac.in](mailto:savithap@iisc.ac.in)).
12. Any technical questions or request for site-visit/audit can be directed to Dr. Savitha P, GF-20, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. ([savithap@iisc.ac.in](mailto:savithap@iisc.ac.in)).

Details of the Facility/Site

Utility building for National Nano Fabrication Center is a 3 story building of 9,000 sq. ft. base area where all the utilities for the cleanroom are supported. Salient features of the building are, 1. Ground floor of utility building consists of hazardous and compressed gases like silane and Hydrogen, Oxygen and liquid argon. It also hosts the water treatment plants like Deionization plant and ETP plant.

2. First floor of the building is dedicated for electrical distribution board, UPS backup and chemical storage room.
3. Second floor have compressors, vacuum pumps, water pumps, electrical panels and a chemical storage room. Other features which need to take into consideration are
  - a. Generator room with electrical switching panels and generator synchronizers.
  - b. All chemical rooms and electrical room have air conditioning facility.
  - c. Users/workers continuously work in and around the building Population varies from 0 to 10, without a set pattern.
  - d. There is a diesel generators and liquid nitrogen tank adjacent to the building. For site details please contact Dr. Savitha P, GF-20, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. ([savithap@iisc.ac.in](mailto:savithap@iisc.ac.in)).

Types of hazards

The utility building for cleanroom has several fire hazards, including chemicals, pyrophoric gases and high electrical-load. A limited list of these hazards is:

1. Flammable and oxidizing, and pyrophoric gases, that are stored in pallets and cylinders.
2. Chemical storage rooms where several 100s of liters of concentrated acids, bases, solvents, and oxidizers are stored.
3. Chemical waste effluent treatment plant processing waste acids and bases.
4. Electronic circuit boards (PCBs), electrical distribution panels and electrical UPS battery bank with a combined load of 750 kVA
5. Water pumps, compressed dry air plant, vacuum plants and some HVAC related equipment

Any fire-suppression system must account for the range of hazards and must be designed keeping the geography (placements) of the hazards. For a more in-depth understanding and audit, vendors can visit the facility with prior appointment. Contact Dr. Savitha P, GF-20, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. ([savithap@iisc.ac.in](mailto:savithap@iisc.ac.in)).

Technical Requirements

1.	Main application	<ol style="list-style-type: none"> <li>a) Suppress any fire in the facility within seconds.</li> <li>b) Interface with the building software so that the fire-alarm triggers the suppression system automatically.</li> <li>c) Real-estate is very limited. System must have a low footprint.</li> <li>d) System should need minimal maintenance or upkeep. Systems that need regular replacements or spares will not be considered.</li> <li>e) System must be local and addressable. The BMS should be able to trigger the suppression in specific area. Blanket suppressions will not be considered.</li> <li>f) The system should conform to some industrial safety standard, e.g.                             <ol style="list-style-type: none"> <li>i) Industrial Risk Insurers IM.17.1.1 Guiding Principles for the Protection of Semiconductor Manufacturing Facilities</li> <li>ii) SEMI S14-1016 - Safety Guidelines for Fire Risk Assessment and</li> </ol> </li> </ol>
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		<ul style="list-style-type: none"> <li>iii) Mitigation for Semiconductor Manufacturing Equipment</li> <li>iv) NFPA 318, Standard for the Protection of Cleanrooms, National Fire Protection Association</li> <li>iv) Factory Mutual Property Loss Prevention Data Sheets 7-7/17-12, Semiconductor Fabrication Facilities</li> </ul>
2.	Facility type	<ul style="list-style-type: none"> <li>a) The system must be compatible with utility or maintenance facilities.</li> <li>b) Vendor MUST show evidence of atleast 3 prior installations at similar (or larger) scale cleanroom facilities.</li> <li>c) The suppression agents must be distributed to provide adequate protection. The individual agents should be addressable.</li> <li>d) Critical sites, such as gas-storage, chemical storage, and high-power electrical panels, etc. must be covered.</li> </ul>
3.	Other requirements	<ul style="list-style-type: none"> <li>a) The suppression system must interface with our current building management system (BMS). Responsibility of interfacing with existing BMS rests with the vendor.</li> <li>b) The system must be addressable, i.e. the geographic location of the alarm must be provided to the BMS.</li> <li>c) The system must have the ability to be triggered manually. For e.g. if the gas alarm fails to trigger, the fire suppression system could be triggered manually.</li> <li>d) Prefer for the system to interface with the current hooters. This can be through the BMS or directly. If new hooters need to be introduced, they need distributed in enough numbers such that alarm is audible from all corners of the cleanroom.</li> <li>e) The quote must be turnkey. Any new hardware, e.g. hooters, plumbing, software, electrical boxes, wiring, etc. must be included in the quote.</li> <li>f) Please clearly specify any utility requirements, e.g. water, air, electrical sockets, etc.</li> </ul>
4.	Footprint & weight of cylinder storage and other equipment	<ul style="list-style-type: none"> <li>a) Real estate is very expensive. Compact systems are preferred. Please specify the total foot print in cm x cm, volume, and weight.</li> </ul>
5.	System software	<ul style="list-style-type: none"> <li>a) Front panel displaying equipment and process status along with appropriate software to be supplied.</li> <li>b) System must interface with the building management software.</li> <li>c) Complete logs of all the process and system parameters to be available and stored for future trouble shooting</li> <li>d) Please specify the date the system was launched and the time the software will be supported. This is long-time investment. The system MUST have lifetime support.</li> </ul>
6.	Periodic Maintenance	<ul style="list-style-type: none"> <li>a) The system should require minimal maintenance. Mention the recommended preventive maintenance schedule for the system. Provide details of what constitutes preventive maintenance.</li> <li>b) Provide an itemized cost of any accessories needed for periodic</li> </ul>

		<p>preventive maintenance for 3 years. This will be used to calculate life-cycle costs</p> <p>c) Can the preventive maintenance be done by a trained on-site engineer (CeNSE employee) or requires a specialist from the OEM?</p> <p>d) Please provide cost of a 3-year AMC with required kit/consumables in the commercial offer. Scope of AMC is given in Procedures.</p> <p>e) Please note, that system should be supported by a trained local representative with a 24-hour window of response.</p>
7.	Installation and Training	<p>a) Installation and training at customer site, by the experts from OEM should be part of the package.</p> <p>b) During the installation all the specifications should be verified for acceptance by the customer.</p>
8.	Power & utilities	<p>a) The instrument should work with Indian electrical standards</p> <p>b) Mention the power requirement.</p> <p>c) Mention ALL utility requirement (water, air, exhaust, cooling, etc.)</p> <p>d) Mention environmental restrictions, i.e. operational temperature, humidity etc.</p> <p>e) Support hardware, such as chillers, air compressor and UPS requirements, if any, must be mentioned.</p> <p>f) Mention any adverse environmental or human impact that might occur if the system is triggered</p> <p>g)</p>
9.	Safety	<p>a) Mention any special safety requirement of the system</p> <p>b) The system must come with a complement of interlocks to prevent common user errors.</p> <p>c)</p>
10.	Recommendation	<p>a) The system must submit references from at least 3 previous installations at similar or larger utility areas.</p> <p>b) The names and contact addresses of the referees must be submitted with the proposal, so the purchase committee can contact them independently.</p>
11.	Acceptance tests	<p>a) As per industry standards</p>

Thanking you,



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