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| --- | --- | --- | --- | --- | --- |
| Research Process Overview | | | | | |
| **Date:** |  | **Project #:** | LFO : | Principal Investigator (PI): |  |
| **Lab Safety Officer:** | |  | | **HSE Representative:** |  |
| **Other Review Team Members**: | |  | | **Lab Location:** |  |
| **Reason for POSHER:** | | * Initial Review  New Chemical or Process  Response to Audit  Specific Request | | | |
| **Brief Overview of Research/ Laboratory Process:** | |  | | | |
| **Brief Description of Primary Hazards:** | |  | | | |

IMPORTANT! Please contact:

1. Institutional Biosafety and BioEthics Committee at [IBEC@kaust.edu.sa](mailto:IBEC@kaust.edu.sa) if your research involves biological materials/ biological agents, plants and plant-pathogens, genetically modified organisms and/or recombinant/synthetic nucleic acids (r/s N/A), human subject research.
2. Please contact [IACUC@kaust.edu.sa](mailto:IACUC@kaust.edu.sa) if your research involves animals (laboratory and/ or field) regardless of the acquisition source (vertebrates and/or invertebrate animals).

Please contact Research Safety at [researchsafety@kaust.edu.sa](mailto:researchsafety@kaust.edu.sa) to request the Biological Agents/ Biological Materials Inventory form.

Please contact ERM to establish a chemical inventory: [david.wells@kaust.edu.sa](mailto:david.wells@kaust.edu.sa)

| **Facilities Services Requirements Review** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **What Type of Facilities Services/Equipment Do You Need?** | **Yes** | **No** | | **If Services Don’t Exist, Then List Actions Required** | | **Action Owner** |
| 1. House Compressed air? |  |  | |  | |  |
| 1. House Vacuum? |  |  | |  | |  |
| 1. House DI/RO Water? |  |  | |  | |  |
| 1. Local process cooling water? |  |  | |  | |  |
| 1. Local (process specific) gas sources? |  |  | |  | |  |
| 1. Chemical Fume Hood? |  |  | |  | |  |
| 1. Other local exhaust ventilation (LEV)(e.g. snorkel)? |  |  | |  | |  |
| 1. Will a biosafety cabinet be required? If yes, initial and annual certification is required. If relocating the biosafety cabinet from another location, the cabinet should be decontaminated. Contact the Biosafety Specialist for more information. |  |  | |  | |  |
| * 1. Make initial determination of type and contact |  |  | |  | |  |
| 8.2 Any modification for the BSC required to accommodate equipment? (e.g, sash modified for microscope use, etc.) NOTE: PI responsible for additional cost |  |  | |  | |  |
| 1. Any additional special large equipment needed? (e.g. lyophilizer, flow cytometer, autoclave, etc. NOTE: Please make every effort to include ALL needed equipment |  |  | |  | |  |
| 1. Growth chamber? |  |  | |  | |  |
| 1. Cold Room? |  |  | |  | |  |
| 1. Electromagnetic Interference (EMI) protection? |  |  | |  | |  |
| 12.1 Is this process likely to be a source of EMI to others? |  |  | |  | |  |
| 1. Vibration protection? |  |  | |  | |  |
| 1. Will hazardous gases (flammable, toxic, corrosive, etc.) be used? Describe: |  |  | |  | |  |
| 1. Will non-hazardous compressed gases used? Describe: |  |  | |  | |  |
| 1. Are there special electrical requirements for your equipment (UPS Voltage, Amperage, Phase or Plug Connections)? |  |  | |  | |  |
| 1. Are there specific labels/standard signage required beyond basic door lab signage? (i.e. Laser ,x-ray, radioactive, biohazard, etc) |  |  | |  | |  |
| 17.1 Biohazard |  |  | |  | |  |
| 17.2 Laser |  |  | |  | |  |
| 17.3 Radioactive |  |  | |  | |  |
| 17.4 Other |  |  | |  | |  |
| **Hazard Identification** | | | | | | |
| **Which Type of Hazards Exist in Your Work?** | **Yes** | **No** | **Comments** | | **If “Yes”, Go to Section:** | |
| Chemical Hazards (Solids, Liquids or Gases) |  |  |  | | A | |
| Biological Hazards (infectious agents, biological toxins, cell and tissue culture, pesticides, animals, etc.) |  |  |  | | B | |
| Ionizing Radiation Hazards (Radioactive Material, RPE) |  |  |  | | C.1 | |
| Non-ionizing Radiation Hazards (Lasers, RF, magnetic fields, etc.) |  |  |  | | C.2 | |
| General Equipment/Process Hazards (e.g. high temp. or noise) |  |  |  | | D | |

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| --- |
| **Section A – Chemical/Gas Hazard Review** |
| **Section A.1 – Hazardous Chemical/Gas Use Information, based on MSDS data and OSHA definitions of hazardous chemicals, 29CFR 1910.1200**  **https://www.osha.gov/dsg/hazcom/ghd053107.html** |

| **List:** All hazardous chemicals, biological agents, and by-products associated with this process that present a significant health hazard (i.e. a rating of 3 or 4 in the blue square on the NFPA chemical hazard label shown below or some other similar means of warning label):  **Example Label**  NFPA Health Hazard Label - 2 | **Identify:**  Solid  Liquid  Gas | | | **Estimate:**  Maximum monthly/ annual usage rates | | **Indicate:**  Storage capacity requires, Estimated use for storage | **Estimate amount to:**  Drain  Exhaust  Hazardous waste | **Indicate if:**  Toxic  Pyrophoric  Flammable/Combustible  Oxidizer  Dust source  Corrosive  Odour detectable  Volatile organic compound  Radioactive  Asphyxiant  Carcinogenic  Reproductive toxin  Teratogen  Mutagen  USA DOD chemicals of concern  Controlled substances | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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| **Section A.2 - Chemical Hazard Review Questions/Action Items** | | | | | | | | | |
| **Chemical Process Details** | | **Yes** | **No** | | **Engineering Controls / Details** | | | | **Action Owner** |
| Are there pressurized process or system liquids? (i.e. pumped chemical lines, hydraulics) Describe: | |  |  | |  | | | |  |
| Are there pressurized process gas systems? Describe: | |  |  | |  | | | |  |
| Are external chemical delivery systems required (liquids)? Describe: | |  |  | |  | | | |  |
| Are there open liquid chemical baths (wetbench)? | |  |  | |  | | | |  |
| Beyond standard Right to Know (MSDS), are communications to employees working with individually regulated chemicals required? (e.g. Formaldehyde, asbestos, methylene chloride, lead, mercury) | |  |  | |  | | | |  |
| Is a Standard Operating Procedure for gas connection/purging or chemical filling required? | |  |  | |  | | | |  |

| **Section B – Biological Hazard Review** | | | | |
| --- | --- | --- | --- | --- |
| **Biological Process Details** | **Yes** | **No** | **Engineering Controls / Details** | **Action Owner** |
| Are you working with materials that require BSL-1 containment? |  |  | If yes, please list if known |  |
| Are you working with materials that require BSL-2 containment? |  |  | If yes, please list if known |  |
| Will your research involve the following:   * Human cell lines, blood, unfixed tissues/organs, bodily fluids * Bloodborne Pathogens |  |  | If yes, contact Institutional Biosafety and Bioethics Committee before working with materials.  Additional Tasks: Complete Bloodborne Pathogens Training, Exposure Control Plan and Hepatitis B Vaccination Form. |  |
| Will your research involve:   * Recombinant/Synthetic Nucleic Acid * Risk Group 2 Pathogens * Viral Vectors * Biotoxins * Genetically Modified Organisms * Invasive/Noxious Plants * Gene Editing Technology (CRISPR) * Potentially Infectious Environmental Samples * Nanotechnology |  |  | If yes, contact Institutional Biosafety and Bioethics Committee before working with materials. |  |
| Will your research involve animals? |  |  | If yes, contact Institutional Animal Care and Use Committee before working with animals. |  |
| Will your research involve field work? |  |  | Additional Task: Field Safety Training |  |

| **Section C – Radiation Hazard Review** | | | | |
| --- | --- | --- | --- | --- |
| **Section C.1 – Ionizing Radiation Hazards** | | | | |
| **Radiation Process Details** | **Yes** | **No** | **Engineering Controls / Details** | **Action Owner** |
| Does this process involve the use of ionizing radiation devices (i.e. Radiation Producing Equipment)? **Examples:** accelerators, x-ray machines (diagnostic, therapy, diffraction), electron microscopes, reactor or fusion devices? |  |  |  |  |
| Does this process involve the use of radioactive material? |  |  |  |  |

| **Section C.2 – Non-ionizing Radiation Hazards** | | | | |
| --- | --- | --- | --- | --- |
| **Radiation Process Details** | **Yes** | **No** | **Engineering Controls / Details** | **Action Owner** |
| Does any equipment present a source of RF/Microwave energy which can present a hazard in normal use or in service? If yes, are there interlocks or other user protection? |  |  |  |  |
| Does the equipment involve the use of Class 2 or 3a lasers? If yes, are the following requirements in place for labelling:   * “Caution LASER” * Hazard class * Power of the LASER * Type of LASER * Wavelength * Pulse duration if applicable   Note: For Class 3a LASER – Door should be labelled with the same info as the LASER label. |  |  |  |  |
| Does the equipment involve the use of Class 3b or 4 lasers? If yes, then are the following requirements in place?   * Have all users attended Laser Safety training offered by HSE? * Has the laser been registered with HSE? * Is there appropriate entryway protection and access control for the laser work area? * Is there appropriate eye protection available? * If excimer lasers are present, is Cl or F gas properly supplied and vented? (e.g. gas cabinets for cylinders and sufficient exhaust for the laser?) |  |  |  |  |
| Are there any other sources of non-ionizing radiation that require controls to ensure personnel safety? (e.g. magnetic fields >5 gauss, UV, etc.) |  |  |  |  |

| **Section D – General Equipment/Process Hazard Review** | | | | |
| --- | --- | --- | --- | --- |
| **General Equipment/Process Issues** | **Yes** | **No** | **Engineering Controls / Details** | **Action Owner** |
| Are there processes or equipment that should have “off hour” use restrictions for normal use or service? Describe and explain. |  |  |  |  |
| Should the equipment or process have buddy-system requirements for normal use or service? Describe and explain. |  |  |  |  |
| Are you using any syringes and needles? |  |  |  |  |
| Are there noises over or approaching 85db (e.g. sonicators and other equipment)? If yes, then hearing protection and appropriate signage will be required. |  |  |  |  |
| Are there exposed sources of electrical voltage? |  |  |  |  |
| Are there exposed hot surfaces? |  |  |  |  |
| Are you using an autoclave? |  |  |  |  |
| Is a written standard operating procedure (SOP), including start up / shut down of equipment, available? |  |  |  |  |
| Are there special hazards associated with start up or shut down? |  |  |  |  |
| Is equipment specific training required for users? How are training records maintained? |  |  |  |  |
| Is personal protective equipment required for the user/operator? |  |  |  |  |
| Is maintenance required while the equipment is on? Interlocks? |  |  |  |  |
| Is mechanical guarding required? (cutting devices, grinders, pinch points, etc) |  |  |  |  |
| Are there vibration sources? Vibration mitigation? |  |  |  |  |
| Are there ergonomic concerns with the process or equipment? |  |  |  |  |
| Is a local process exhaust required? Why? |  |  |  |  |
| Will the process involve the production of chemical waste, regulated medical waste, biological waste, radioactive waste, or other hazardous waste? If yes, then how will it be collected and disposed of (red bags, sharps, burn boxes)? Have personnel been trained accordingly? |  |  |  |  |
| Will the process involve the shipping or transfer of any hazardous materials (e.g. dry ice, samples in formaldehyde or ethanol)? If yes, have **all shippers of hazardous material been trained and have received a certification from EHS to show compliance with export controls? Contact HSE for more information.** |  |  |  |  |

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| --- | --- | --- | --- | --- |
| **Training Assessment** | | | | |
| **Minimum Training Requirements** | **Yes** | **No** | **Comments/Action Items** | **Action Owner** |
| The following training is required for your lab regardless of the type of process or research utilized.   * Laboratory Safety Training * Hazardous Waste Training * Emergency Incident Preparedness Training |  |  |  |  |
| **Additional Training Requirements** | **Yes** | **No** | **Comments/Action Items** | **Action Owner** |
| Identify the additional training required for laboratory personnel based on the hazards involved and listed above. (E.g. Radiation Safety Training, Laser Safety Training, etc.). Please consult link for available HSE trainings: https://facilities.kaust.edu.sa/resources/safety/Lab/Documents/Training\_Course\_Listing.pdf or contact [Researchsafety@kaust.edu.sa](mailto:Researchsafety@kaust.edu.sa) for a list of available safety trainings |  |  |  |  |
|  |  |  |  |  |
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| **Final Review & Assessment** | | | | |

| **Emergency Requirements** | **Yes** | **No** | **Engineering Controls / Details** | **Action Owner** |
| --- | --- | --- | --- | --- |
| Are eyewash / showers required? |  |  |  |  |
| Are chemical spill kits required? |  |  |  |  |
| Are biohazard spill kits required? If YES, please contact [researchsafety@kaust.edu.sa](mailto:researchsafety@kaust.edu.sa) (recommendations for basic kit contents). There is no need to buy a pre-made biohazard spill kit. |  |  |  |  |
| Is there a First Aid kit(s) available? |  |  |  |  |
| Are there any special first aid kit antidote/cream required? (e.g. Calcium gluconate gel if hydrofluoric acid used in lab) |  |  |  |  |
| Is local fire suppression required? |  |  |  |  |
| Is Toxic Gas Monitoring Required? |  |  |  |  |
| Are Local Alarms/Indications Required? |  |  |  |  |
| Will changes be required to emergency response protocol? |  |  |  |  |
| Are there any special lab shutdown procedures? |  |  |  |  |

| **Risk Assessment Questions** | **Yes** | **No** | **Comments/Action Items** | **Action Owner** |
| --- | --- | --- | --- | --- |
| Are you familiar with the HSE Lab Safety Manual? |  |  |  |  |
| Have you completed a Lab Safety Specific Plan? |  |  |  |  |
| If yes, has anything changed since you completed it (explain)? |  |  |  |  |
| Have you had any recent accidents or near misses? |  |  |  |  |
| Do you have any safety concerns or issues you would like to discuss? |  |  |  |  |
| **Summary of Attachments:** List all documents and SOPS that are or will be provided in association with the POSHER | | | | |
| Examples include: Material Transfer Agreement (MTA), Permits for Biological Materials/ Biological Agents, Biological Risk Assessments, Biological Agents/ Biological Materials Inventory, Chemical Inventory, IBEC and/or IACUC Protocol Application #s, Radiation Permit, Equipment Operating Procedures including emergency shut down start up, Equipment Information Sheet, Standard Operating Procedures, BBP-ECP, etc. | | | | |

**Conclusion**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Given what is currently known and assuming all open actions are closed, can this research process be safely conducted at KAUST? | Yes |  | No |  |  |

| Action Registry | | | | |
| --- | --- | --- | --- | --- |
| **Issue** | **Action Required** | **Action Owner** | **Due date** | **Completed** |
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I have reviewed this POSHER form together with RST safety officer and concur with the content and conclusion.

Signature and Date