

Project Planning, Work Control, and Research Execution at CAES

Project planning, work control, and research execution at CAES follows a multi-step process: project proposal; work planning and safety envelope development; and research execution, feedback, and closeout.

The CAES process will utilize a graded approach for approval of all work conducted at the CAES facility. In this approach, greater attention will be given to requests that represent greater hazards. For example, the assignment of a short-term project that requires the use of non-laboratory space for routine office activities could be simple, whereas a multi-year project using hazardous agents or novel processes would require greater scrutiny to ensure that the associated hazards can be adequately managed.

The Principal Investigator (PI) will work with the CAES Research Laboratory Manager (RLM) and the CAES Safety Officer (CSO) to prepare documentation with an appropriate outline of the project and an overview of the hazards involved. The CAES Executive Board (EB) reviews and approves the work at CAES for mission alignment and overarching facility envelope.

The laboratory space assignments, along with work control and safety envelope preparation, are supported by the RLM, CSO, Laboratory Leads (LL), and appropriate Subject Matter Experts (SME) related to the project's scope. These individuals make up the CAES Safety Committee, which approves the work control and safety envelope for the project and its location within CAES.

The research execution, feedback and closeout are overseen by the PI, RLM, CSO, and LL. This is expected to be a collaborative effort to refine research methods and ensure research at CAES is conducted with researcher safety as the highest priority. Feedback is necessary in order to confirm the work hazards have been sufficiently identified and the safety envelope instituted for the project has not changed during the research execution process. At the conclusion of the project, the PI is expected to perform a closeout process. This process identifies the disposition of equipment installed, whether it will be removed from CAES, or if additional research may benefit from the equipment remaining within CAES past the project's completion.

The PI must plan work in accordance with existing home institution policies, procedures, and requirements, while at the same time meeting any additional CAES requirements. In the event that an investigator is denied CAES occupancy following good faith efforts to resolve any issues with the CAES Safety Committee, the investigator may appeal the decision to the CAES Director. In addition, projects and/or investigators removed from the building for failure to adhere to building requirements may appeal the decision to the CAES Director for an ad hoc review and reconsideration.

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Guide for Project Planning, Work Control, and Research Execution at CAES.		
Note: "Principal Investigator" or "PI" means project/program/team leader, principal investigator.		
Step	Activity/Initiator/ Approver	Description
0	Guiding Principles Initiator: All	All activities within CAES will be consistent with the CAES guiding principles: <ul style="list-style-type: none"> • Collaborate respectfully • Foster discovery and cultivate a community of learning • Evaluate hazards and mitigate risk for every task every time • Utilize stop work authority • Demonstrate a questioning attitude • Nurture an environment of cultural enrichment that includes diversity and inclusion
Project Proposal		
1	Initiate Project Proposal Initiator: PI	Contact CAES Safety Officer (CSO) or CAES Research Laboratory Manager (RLM) to gain understanding of how to initiate a project at CAES.
1a	Submit Project Proposal Initiator: PI Approver: RLM	Submit completed CAES-047 Project Proposal form to RLM (not all uses of CAES will require the installation of equipment). RLM will review to determine if the form is complete and ready for submittal to Executive Board. An export control check must be completed in this step.
2	EB Review Initiator: PI and RLM Approver: EB	Before the PI begins a detailed work-planning process, the CAES Executive Board (EB) completes a review to assess the project's alignment with the CAES mission, the availability and capacity of CAES, and whether the project's hazards can be managed within the CAES operating envelope. NOTE: To expedite this screening and minimize impact on the project, PIs should contact the CAES Associate Director (AD) affiliated with their university or employer (BSU, ISU, UI, or INL) prior to initiating this step.
3	CAES Project Proposal Decision Initiator: Appropriate institutional AD	Receive a decision from your AD via email regarding the project proposal to assess the project's alignment with the CAES mission, the availability and capacity of CAES, and whether the project's hazards can be managed within the CAES operating envelope. Once the Project Proposal is approved and the PI has been notified of the approval, the PI will need to submit a work plan within 90 days for review. If a work plan has

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		<p>not been submitted within the 90 days for review, the proposal will be archived and removed from the approved active list.</p> <p>Archived Project Proposals would need to be fully re-evaluated at the time that the PI requests to resume discussion of experimental activities at CAES.</p>
Work Planning and Safety Envelope		
<p>4</p>	<p>Create a Work Plan</p> <p>Initiator: PI, supported by RLM</p>	<p>Working closely with the CAES RLM, PIs will decide on the level of work plan documentation that is appropriate for their project.</p> <p>Based on the level of hazards, documentation may range from a simple operating procedure for low-risk activities, to detailed hazard mitigation plans for high-risk activities (form CAES-048 Work Plan).</p> <p>The PI(s) will work with the RLM who will aid in identifying and coordinating input from appropriate subject matter expert(s) (SMEs), as warranted, to develop a robust work plan safety envelope.</p> <p>Work planning is based on a graded approach. In all instances, the work-planning process will systematically address the required elements of CAES work control:</p> <ul style="list-style-type: none"> • Activity/Task descriptions • Home institution approvals (as needed) • Export Control mitigations • Hazards and controls • Waste generation and disposal • Training • Emergency procedures • Exit strategy (returning facility to original condition) <p>In the case of routine, low-risk, researcher-controlled work, the PI is required to document (with CSO confirmation) that the performer has the proper knowledge, skills, experience, and/or training to perform the work safely using CAES-002 Researcher Controlled Activity template.</p> <p>In more complex cases that may entail more risk, the PI is required to document work activity hazards, mitigations and controls. A work control plan shall be developed using form CAES-048. Completed work control plans are submitted to the CSO.</p> <p>For equipment operation, the level of documentation is determined by the type, complexity, hazards of operation, and nature of application. The Equipment Standard Operating Procedure template shall be used unless otherwise negotiated with the CSO.</p> <p>CAES training is implemented at four levels: facility, core laboratory, laboratory-specific, and project-specific. The current required trainings for the first three levels and unescorted laboratory access are implemented through the CAES Training System, <i>Litmos</i>. CAES-specific protocols are superseded by and need to align with any and all existing safety standards of the CAES building facilitator, Idaho State University (ISU).</p>

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<p>4a</p>	<p>Area Hazards and Off Normal Conditions</p> <p>Initiator: PI, supported by RLM</p> <p>Approver: CSO with Safety Committee</p>	<p>In many cases, the hazards associated with a project only present a risk to the researchers working on that project. However, some project hazards may pose a risk to other researchers who are or may be working in the same area or may prevent other research activities from being conducted at the same time.</p> <p>In addition, project researchers may not be present at all times during the execution of research and conditions associated with their project may change. Non-project personnel who share the use of the laboratory (or other) space need to be informed of such conditions and basic hazard mitigations in the event that off-normal conditions arise.</p> <p>An area hazard and/or off-normal condition list may not provide an exhaustive source of information regarding all of the hazards associated with a project, but it can cover hazards that are likely to affect other projects or personnel within the laboratory space and provide reasonable actions to facilitate a safe response.</p> <p>Responsibilities for Area Project Hazards and Off-Normal Conditions:</p> <ul style="list-style-type: none"> • PI documents hazards for their project that could affect other research or research personnel working in the area. • PI documents off-normal conditions that are recognizable to other research and safety personnel regarding their project and suggests actions which could be taken to minimize injury or accidents. • PI and CSO decide how potential area hazards and off-normal conditions are communicated to personnel who have unescorted access to the laboratory. • Individual Contributor ensures they are familiar with all area hazards and off-normal conditions in a laboratory. <p>Process</p> <p>The PI generates a list of area hazards and off-normal conditions as part of their Work Plan and submits the list to the CSO, who works with the CAES Safety Committee to determine a path towards approval. This process includes determining actions on how to communicate the appropriate information to laboratory personnel who have unescorted access rights. The list shall include:</p> <ul style="list-style-type: none"> • Name and description of hazard or condition. The description should include enough information for a person to readily distinguish between a normal and an off-normal condition. For example, a small accumulation of water (1/4 cup) on the floor versus an accumulation of water on the floor in excess of one gallon. • Response actions for non-project laboratory personnel to take to mitigate or avoid risks associated with each hazard or off-normal condition. <p>The approved list of area hazards and off-normal conditions will be communicated to laboratory personnel as prescribed by the CSO and RLM.</p>
<p>4b</p>	<p>Submit Work Plan</p> <p>Initiator: PI</p> <p>Approver: RLM or CSO</p>	<p>PI will present the completed Work Plan (CAES-048) to RLM and CSO for review, for readiness and subsequent submission to the CAES Safety Committee. At a minimum, a project review team that includes the CSO and RLM will review each work planning package to ensure it is ready to move in to Step 5.</p>

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5	<p>Focused Review</p> <p>Initiator: CSO or RLM</p> <p>Approver: PI, Lab Lead, CSO, RLM</p>	<p>The CAES CSO or RLM will present the approved Project Proposal (CAES-047) and the completed Work Plan (CAES-048) forms for consideration and deliberation by the CAES Safety Committee during a focused review.</p> <p>The committee composition will be based on the type of project and hazards associated with the proposed scope of work. The Safety Committee will address concerns related to space, safety, and facility infrastructure to determine if CAES can support the project and provide feedback to the PI on the type of planning required, and the level of rigor needed to plan and execute the proposed project work scope.</p> <p>The CAES Safety Committee will make every effort to process the form in a timely manner. However, for complex projects, the CAES Safety Committee may request input from subject matter experts as well as a presentation from the PI. It is within the roles and responsibilities of the CAES Safety Committee to deny access due to limited resources.</p> <p>For short-term low-risk activities, the CAES RLM and CSO may approve the space assignment without additional review by the CAES Safety Committee. All short-term low-risk activities that overrun 6-month window must submit a full application for review by the CAES EB and CAES Safety Committee.</p>
6	<p>Prepare for Readiness Review</p> <p>Initiator: PI</p> <p>Approver: CSO</p>	<p>This includes installing the project equipment, assembling any apparatus, and preparing to start research following the Readiness Review.</p>
6a	<p>Readiness Review</p> <p>Initiator: PI and CSO</p> <p>Approver: Lab Lead, CSO, RLM</p>	<p>Before project startup, the PI and the project review team will complete activities needed to finalize project readiness (e.g., final walk down), personnel (e.g., training) and equipment (e.g., installation and passive testing). Approval to start work is granted by the CSO when the Readiness Review is completed. If the check identifies any pre-start items, it is the responsibility of the project's PI to resolve all pre-start items before starting work.</p> <p>CSO, RLM, and Lab Lead perform Readiness Review per CAES-003 Readiness Check. The content of the review, level of rigor, and participants will be tailored to the project. The review consists of an informal presentation of experimentation to selected Safety Committee members, at a minimum the PI, Lab Lead, designated SMEs, CSO, and RLM.</p> <p>NOTE: More than one readiness review may be required prior to approval.</p>

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Conduct Research, Feedback, and Closeout		
7	<p>Update Laboratory Manual</p> <p>Initiator: PI and CSO</p>	<p>A Laboratory Manual is maintained in each laboratory or other research space. A current copy of your Work Plan and appendices will be placed in the Laboratory Manual and updated each time changes are made to the project.</p> <p>In consultation with the CSO, the project PI must manage configuration of project documentation. Additionally, CAES occupants are expected to communicate information about their projects by participating in building and other seminar series, information exchanges, meet and greets, and other community-building and collaboration-promoting activities.</p>
8	<p>Conduct Research</p>	<p>Project is approved to start work.</p> <ul style="list-style-type: none"> • Approved Projects/Programs must move into CAES within 60 days of approval (unless there are extenuating circumstances that are communicated to the CAES RLM). • Projects/Programs who are assigned space and move into CAES, but then fail to use space will be subject to review by CAES RLM and CAES Safety Committee. This review may lead to space loss or removal from CAES. • Projects/Programs will be required to submit a space self-evaluation annually through project completion, to be evaluated by the CAES EB and CAES Safety Committee. This is in addition to reviews due to changes in the project scope by CAES Safety Committee. • Projects/Programs can be approved and placed on CAES waitlist if space is not available.
9	<p>Perform Routine Inspections</p> <p>Initiator: PI and CSO</p>	<p>The PI and CSO are responsible for performing routine inspections to confirm that the work environment and equipment continue to function as planned, to support productive and safe work. Individual contributors are encouraged to lead or participate in these inspections, which are conducted using the CAES Laboratory Safety Inspection Checklist, CAES-007. The inspections can be used as a teaching tool for students. Inspection results may be a rich source of lessons learned that should be communicated to others in the CAES.</p>
10	<p>Potential Scope Change(s)</p> <p>Initiator: PI and CSO</p> <p>Approver: CSO with Safety Committee</p>	<p>As activities are performed, the PI is responsible for engaging the CSO to assess if a possible change in scope warrants a subsequent change in the project documentation, including hazard identification and mitigation. The PI will engage the CAES RLM and CSO to develop and approve updates to the work plan due to a change in scope. Depending on the magnitude of the change in scope, this may require additional home institution safety committee and CAES Safety Committee reviews.</p> <p>NOTE: Home Institution processes must also be followed for work plan reviews. In addition, the PI should determine if lessons learned during project execution warrant a change in how the work is performed and communicate changes to others in the CAES.</p>

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11	<p>Safety Committee Oversight</p> <p>Initiator: PI and Safety Committee</p>	<p>The CAES Safety Committee will meet regularly and provide a forum for crosscutting safety-related issues. The responsibilities of this committee include making decisions on changes to CAES Environment, Safety and Health and operations processes, sharing and distributing lessons learned, and providing a forum for CAES occupants to communicate ideas and concerns.</p>
12	<p>Work Plan Review</p> <p>Initiator: RLM and PI</p>	<p>At a minimum, the project work plan will be assessed and documented annually. Project will also undergo a Safety Committee review every three years. The purpose of these reviews is to determine whether current work scope adheres to existing work control documentation, including operating procedures, hazard identification, and the safety envelope boundaries.</p>
13	<p>Project Extension/ Completion</p> <p>Initiator: PI and CAES Safety Committee</p>	<p>Applying for an extension:</p> <p>The following steps are required for all projects where extensions are requested:</p> <ul style="list-style-type: none"> • an examination of the risk envelope (hazards/mitigations) to assure nothing has changed or been added. • an evaluation of “lessons learned” for potential improvements to processes (safety, efficiency, effectiveness, etc.). <p>Following completion of these steps (with assistance from the RLM, CSO, or other members of the CAES Safety Committee as needed), the PI may request an extension of time from the CAES Safety Committee. A new work plan is not necessary.</p> <p>Projects/Programs must inform the CAES Safety Committee if it intends to apply for extension. This can be accomplished through a written notification (email, etc.) to the CSO.</p> <p>Incumbent projects/programs in CAES that are applying for extensions will have no advantage over waitlisted projects or new projects/programs that are submitting initial space requests.</p> <p>If project is complete:</p> <p>Space within CAES is allocated on a project-by-project basis. Upon project completion, as described in the work plan exit strategy, investigators are expected to:</p> <ul style="list-style-type: none"> • Notify CSO and RLM of project completion. • Vacate and return the assigned space to useable condition within 10 business days of the end of project. • PI must meet with CSO to schedule and dispose of hazardous and radiological wastes. Delays and fiscal responsibilities are by default accepted by the PI’s Home Institution.

All forms referenced in this document can be found online at the following web address:

<https://www.caesenergy.org/caes-insider/#working-in-caes>

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