**COMPLIANCE IS MANDATORY**

|  |  |  |
| --- | --- | --- |
| **Responsible Office:** | | Code 500/AETD Safety |
| **Title:** | AETD Safety Plan | |

**Preface**

1. **PURPOSE**

This document provides the requirements for the Applied Engineering and Technology Directorate (AETD) safety program and documents the AETD safety policy. It is the policy of AETD to provide a safe and healthful work environment for all AETD personnel (civil servants and contractors). AETD facilities and work processes, shall at a minimum, meet all applicable federal, agency, and Center requirements.

1. **APPLICABILITY**

This applies to all AETD personnel and facilities and all personnel working within those facilities. For AETD contractors, it is applicable through contract clauses in conformance with NASA Procurement Regulation (Part 1, Subpart 52 and Part 14, Subpart 6).

1. **AUTHORITY**

29 CFR 1900 to 1910, Occupational Safety and Health Administration

NPR 8715.1, NASA Occupational Safety and Health Programs

GPD 8715.1, Goddard Space Flight Center Safety Policy

GPR 8710.8, GSFC Safety Program Management

1. **REFERENCES**

NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping

NPR 8715.3, NASA General Safety Program Requirements

1. **CANCELLATION**

500-PG-8715.1.1A

1. **SAFETY**

N/A

1. **TRAINING**

None

1. **RECORDS**

|  |  |  |
| --- | --- | --- |
| **Record Title** | **Record Custodian** | **Retention** |
| Internal Audits/Reviews | Office conducting the audit/review | Three years |
| Facility Analysis | Branch Office | Life of the equipment |

*\* NRRS – NASA Records Retention Schedule (*[*NPR 1441.1*](http://nodis3.gsfc.nasa.gov/)*)*

1. **MEASUREMENT/VERIFICATION**

The Directorate shall continuously determine the health of the AETD Safety Program by reviewing the following metrics obtained from the Divisions and the AETD Safety Risk Reporting Tracking (SRRT) System. Metrics shall include civil service and contractor personnel. The metrics shall be reviewed quarterly at an AETD Staff meeting and during the AETD Safety Committee meetings.

1. Mishaps/Lessons Learned
   1. Number of mishaps/close calls by type (A, B, C, D, or close call) (See NPR 8621.1, NASA Procedural Requirements for Mishap Reporting, Investigation, and Recordkeeping) identified per period
   2. Mishap/close calls corrective actions closed per month
2. Inspections:
   1. Number of quarterly supervisor inspections completed
   2. Average number of findings are open for more than 30 days
   3. Number of findings per RAC.
   4. Instances in which work was stopped because of an inspection finding
   5. List of items where funds were identified as needed to correct RAC 1, 2, or 3 problems, and length of time taken to provide those funds
   6. List of RAC 1, 2, and 3 items pending work performed by groups other than owner (example: FMD work orders, RECERT work orders, etc.)
   7. Number of inspections attended by division management
3. Training
   1. Training required for employee vs. training completed
   2. Length of time for actions to be taken to bring employee training into compliance
4. Other metrics as created by the AETD Safety Committee.

**Procedures**

In this document, a requirement is identified by “shall,” a good practice by “should,” permission by “may” or “can,” expectation by “will,” and descriptive material by “is.”

1. **Goals and Objectives**

AETD’s goals are to prevent work related injuries/illnesses, loss of facilities/equipment, and shut down of operations due to lack of control of severe hazards or compliance with Federal, NASA and GSFC safety requirements. To achieve these goals AETD shall meet the following objectives. AETD shall not compromise the safety and health of people, property or the environment.

* AETD Management (Director of, Deputy Director and/or Assistant Director) shall demonstrate leadership by:
* Attending at least 80% of Center level safety related meetings (Safety Board of Directors meeting, Goddard Safety Council, etc.) and reporting results to the Director of and Division Chiefs via the AETD Safety Committee (This item also includes the AETD Safety Manger)
* Initiating/attending a minimum of ten (10) lab area inspections at least annually.
* Maintaining a directorate level safety plan and manual, reviewing the documents for possible updates a minimum of every two years.
* Ensuring 100% of the significant close calls and mishaps are investigated, lessons learned are developed, and investigation findings within Code 500 jurisdiction are tracked through closure.
* Division Management (Division Chief, Associate Chiefs, or Assistant Chiefs) shall demonstrate leadership by:
* Attending at least 75% of the Directorate’s or Division’s safety related meetings.
* Ensuring supervisors complete/update 100% of their Task Safety Analysis (TSA)/Job Hazard Analysis (JHA) for all tasks, operations, labs or employees and reviewing them with employees at least annually.
* Attending at least six (6) area inspections within their division at least annually
* Presenting the status of their safety programs; lessons learned, inspections findings, safety related issues, etc. to the Director Of ‘s quarterly safety briefing
* Ensuring supervisors complete 100% of their quarterly area inspections
* Ensure 90% of the lesson learned from mishaps/close calls are briefed to the Director of and the AETD Safety Committee

**2.0 Responsibilities**

The AETD Director of shall:

* Have overall responsibility for the AETD Safety Program and hold management personnel accountable based in part on metrics provided.
* Provide oversight of the Safety Program and the AETD Safety Office, allocating adequate funds and ensuring sufficient qualified staffing for the AETD Safety Office

The Deputy Director of Planning and Business Management (Here after referred to as the Deputy Director) shall:

* Oversee the general functioning of the AETD Safety Program, assisting the Director of where necessary to ensure a proactive approach to safety
* Backing up the AETD Safety Manager at the AETD Safety Committee and the GSFC Safety Council meetings, as needed
* Ensure the Divisions support both the GSFC and AETD Safety Programs
* Support each Division in correcting all safety issues affecting AETD, championing the funding of safety improvements needed to meet requirements within the Center budget process
* Oversee metrics (targets and performance indicators) for safety performance, and ensures appropriate dissemination and action where there are areas of deficiencies.

The AETD Safety Office shall:

* Advise management on Center, Agency, and Federal level changes to safety standards/requirements
* Attend to the daily operations of the AETD Safety Program, providing a resource of safety information for the Divisions
* Provide a resource to help Divisions manage their safety programs
* Provide an interface and manage conflicts between Code 500 and other GSFC Directorates on safety issues
* Review mishap/close call reports for completeness and forward lessons learned to the appropriate GSFC groups, posting copies of safety reports on SRRT.
* Attend/support Center Level safety meetings and committees
* Participate in Division level meetings and inspections, as appropriate
* Provide Directorate level metrics and report on 50X status at the Quarterly Safety Briefing
* Maintain the data on the SRRT web site
* Maintain the AETD Safety Committee Charter (See Appendix C)

AETD Safety Committee responsibilities are spelled out in Appendix C, AETD Safety Committee Charter.

AETD Division Chiefs, Associate Chiefs, or Assistant Chiefs shall:

* Have overall responsibility for all operations and conditions in his/her responsible areas, ensuring all supervisors/branch heads understand their safety responsibilities, motivate their employees to participate in the Safety Program, and follow safe practices for operations.
* Develop/maintain division level addendums to the AETD Safety Manual, as applicable.
* Participate in and appoint a creditable and knowledgeable safety representative to the AETD Safety Committee. (See Appendix C for additional explanation)
* Participate in area inspections on a random basis, visiting each branch’s work areas at least once a year. Labs/areas where risk of serious injury is high and frequent problems exist, inspections by Division Management should be more frequent.
* Provide Directorate management a quarterly briefing on, safety initiatives, high risk operations/equipment and mishaps/close calls with lessons learned, audit/inspection results and metrics, potential issues with other organizations, etc. Issues that have greater impact shall be briefed immediately.
* Ensure Risk Assessment Code (RAC) conditions/situations are corrected, and particularly RAC 1, 2 and 3 conditions. RAC 1 or 2 operations shall be discontinued immediately until mitigated to at least a RAC 3. For all RAC 3 and 4 operations, a risk mitigation plan shall be developed if the risk cannot be corrected immediately, which implements an alternative means of accomplishing the task prior to continuing any work. RAC 3 issues shall be corrected within 30 days. (See Appendix E for determining RACs)
* Complete corrective actions identified in surveys, audits, mishaps, and inspections within 30 day of receipt of the report. RAC 1, 2, or 3 issues open longer than 30 days require an explanation to Directorate Management.

Branch Heads/Supervisors shall:

* Ensure all personnel follow applicable safety practices/standards (this includes personnel working on detail or in locations other than Code 500 operated, contractors and visitors) and have current training/certification for the work being performed and proper personal protective equipment. Supervisors should attend/audit training their personnel attend or a general awareness course, which covers hazards, at least once to understand the safe practices employees are expected to follow.
* Review/approve all plans that mitigate risks to personnel from operations or equipment
* Immediately notify Division Chief of mishaps/close calls that are high visibility or result or could result in hospitalization or death, as well as completing the Center mishap reporting requirements
* Investigate all mishaps and close calls and where applicable, ensure lessons learned are distributed throughout the organization.
* Ensure results/verification or correction of inspections discrepancies; mishaps, surveys and audits are entered in web-based safety management system.
* Ensure all areas occupied by their employees are inspected at least quarterly for non-office areas and twice a year for office areas and findings are entered in the web-based safety management system. (Note: Quarters shall start from Jan 1 each year.) (See section 8.0 for more details on inspections)
* Ensure all personnel participate in the Safety Program in some manner (Examples of participation include serving on branch, division, or directorate level safety committees, developing/reviewing and signing procedures and JHA, participating in area inspections, serving on mishap/close call investigation teams, providing safety related briefings, etc.)
* Ensure the AETD Safety Office is aware of all non-routine hazardous operations and equipment that may pose a RAC 1, 2, or 3 hazard to employees.
* Track all safety related items that need additional funding for correction. Estimate of needed funds and requirements to be met shall be forwarded to Division Chiefs.
* Maintain a list of all hazardous operations within their jurisdiction, approving all hazardous operating procedures.
* Ensure hazard analysis and procedures are written/updated and approved for hazardous operations
* Create Job Hazard Analysis (JHA) for their employees, annually review JHA with them and document review was complete

Division/Branch Safety Representatives’ duties are listed in Appendix C, AETD Safety Committee Charter.

Employees shall:

* + Follow safety requirements when performing any task, keeping their workplace in a safe manner
  + Attend all required safety-related training, ensuring certifications are current for all assigned work
  + Participate in the AETD Safety Program in some manner (See section 4.0 for more details)
  + Correct any unsafe situations/acts, if they have the knowledge and equipment to do so or report the situation to their supervisor and safety representative for correction
* Ensure their supervisor is informed of any additions or changes in work that increases the hazard level to themselves or others
* Review JHAs at least annually with their supervisor and notify their supervisor whenever changes in their work assignments require the JHA to be updated or revised.

**3.0 Program Evaluation**

Each quarter Divisions shall report metrics as part of the quarterly Directorate Management briefing. Metrics include: % of area inspections completed; average number of days to close RAC 1/2, 3, and 4 through 7; number of finding by RAC 1/2, 3, and 4 through 7; and status of preparing/reviewing job hazard analysis. Upward trends should be explained and a plan provided to reverse the trend. Trends, which show no improvement within a year period, shall also be explained. When problem areas are noted, the Deputy Director shall work with Division Chiefs to understand the problem and determine the best method of correction.

The Directorate Office may perform periodic audits to verify the Program status. The AETD Safety Office should audit Division inspection programs, internal audits, and mishap/survey closures. Results of the Safety Office audits shall be sent to the Deputy Director/Associate Director, highlighting the RAC 1, 2 or 3 problem areas found in the Divisions. Closeout of all identified discrepancies from all audits shall be tracked through closure. Closure should be completed within 30 days of receiving the report.

On a periodic basis, the program and this document shall be reviewed to determine changes required in the goals, objections or types of metrics kept. Where a change is necessary, it shall be coordinated with the Division Chiefs or their safety representatives.

On at least an annual basis, Divisions should determine the health of their safety programs. A comparison of the metrics from audits/inspections and surveys shall be done to determine the lack of downward trends. Where trends are seen as high or climbing, a change in the program emphasis should be made. Additionally, audits should be performed of paperwork (procedures, plans, and/or training documentation), observations, and employee interviews to determine an understanding of the applicable requirements.  (Contact the AETD Safety Manager for assistance with audit checklists to ensure audits are thorough). Written results shall be entered in the web-based safety management system. All noncompliant items or uncontrolled hazards found shall be analyzed for risk using the RAC system. (See Appendix E.) RAC 1 or 2 operations shall be discontinued immediately until corrected. For all RAC 3 operations, a risk mitigation plan shall be developed, which implements an alternative means of accomplishing the task prior to continuing any work. RAC 3 issues must be correct within 30 days. RACs 4 or higher will be corrected as time permits. Non-compliance findings should be corrected within 30 days.

1. On an annual basis, an authorized employee shall review the implementation of the Center’s Lockout/Tagout Program as required by OSHA 1910.147 for those groups performing lockout/tagout.
2. The Division Safety Representative or employee trained in the program requirements should review at least four of the following areas per year. Different topics should be chosen each year’s such that all applicable areas are covered at least every three years.
   * Confined Space Entry Program
   * Hazard Communication Program (MSDS and knowledge of personnel of the program)
   * Hazardous Chemical Storage Program
   * Hazardous Waste program
   * Personnel Protective Equipment (hazard assessments, equipment selection, use, maintenance, training)
   * Safety Training Program
   * Electrical Safety Program
   * Respiratory Protection Program
   * Hearing Conservation Program

**4.0 Employee Involvement**

Employees (both civil servant and contractor) shall actively participate in the safety program as appropriate for their job, taking part in at least one of the following activities.

* 1. Member of the Division/Branch Safety Committee
  2. Development/review of procedures/ safety related documents (safety manual, Job Hazard Analysis (JHA), safety plans, etc.)
  3. Development/review of safety training courses or attending safety training
  4. Giving safety talks at other meetings
  5. Actively cleaning up work areas
  6. Inspecting areas to identify and correct safety concerns

**5.0 Contractor Oversight**

Divisions/each branch shall ensure contractor personnel comply with Directorate safety requirements. Contractors should participate in the Safety program as listed above under Employee Involvement or other means suggested. Contractors shall notify the Division/Branch of its company’s safety plan and how it plans to ensure employees following GSFC and AETD safety requirements, including properly training their employees for the task being performed. Contractors shall supply proof of training to the COTR for forwarding to branch heads, upon request.

At the Periodic Evaluation Boards, the AETD Safety Manager and Code 350, Occupational Safety and Health Division will provide COTRs with an coordinated assessment of award fee contracts based on an evaluation of their work vs. their safety plan. COTR may provide contractors a copy of the evaluation if deemed beneficial.

**6.0 Workplace Analysis**

Systems safety techniques, including FMEA, OHA, or similar techniques, should be used to identify new and existing hazards in processes and equipment. Facilities that interface with test hardware should be analyzed to verify no hazards are introduced to personnel working on or near the systems and to hardware being tested. All residual hazards shall be assigned a RAC. The Deputy Director and AETD Safety Office shall be notified prior to the purchase of operations/equipment/materials that might pose a RAC 1 or 2. Any hazard with a RAC of 1 or 2 shall require the **operation or equipment to be shut down immediately until the hazard is controlled and accepted. A variance shall be processed per NPR 8715.3 requirements to ensure the appropriate level of review and acceptance.**.

When a stop work situation exits, all ways to mitigate the risk in a cost-effective way shall be explored and a plan presented to the Director of. The plan should indicate the Director of Safety Mission Assurance be included in making the determination as to the continuance of work or not based on the facts. Analysis indicating RACs other than 1 or 2 shall be approved by the applicable Division Chief or branch head. Any RAC of 3 should have controls in place within 30 days. Higher RACs should be worked as time and materials permit. When facilities are modified, analysis shall be updated to ensure additional hazards are not introduced to the system. As open items are closed, backup data shall be provided and kept as part of the analysis package.

Appendix D lists the hazardous operations associated with the Directorate. Job Hazard Analysis (JHA) or Task Safety Analysis (TSA) shall be preformed for all hazardous operations to verify proper controls are in identified and procedures developed, per the requirements of NPR 8715.3. All work should have a JHA. Operations involving hazardous chemicals shall be reviewed to determine if a less hazardous material or smaller quantity can be used. When chemicals are used in a laboratory setting (non-production, mixing chemicals to determine a reaction) a Process Hazard Analysis (PHA) shall be performed per GPR 1700.2, Chemical Hygiene Program as part of the written Chemical Hygiene Program.

**7.0 Mishap Investigation**

Mishaps and close calls shall be investigated and reported per the requirements of NPR 8621.1, NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping, unless agreed by Directorate Management it is unwarranted. NASA Incident Reporting Information System (IRIS) shall be completed as soon as possible. The link is located on the Code 350 web site (http://safety1st.gsfc.nasa.gov/). The Directorate Office and AETD Safety Manager shall be notified by email or phone of any mishaps or high visibility close calls as soon as possible. For any close call or Type C or D mishap, the Director of or Division Chief can appoint a team to determine the root cause(s). Generally for Type C (less than $500,000 to $50,000 damage and/or lost work day cases) or D (less than $50,000 to $1,000 damage and/or OSHA recordable injury) mishaps and close calls (less than $1,000 damage and/or has the potential to cause a mishap), the area supervisor shall be responsible for the investigation. A team, which may be two or more people, including a representative from the group with the mishap, should determine the root cause(s). Mishap/close call lessons learned shall be presented at the Quarterly Division Safety briefings and at AETD Safety Committee. The final report shall be posted on the web-based safety management system. Corrective actions shall be tracked through the web-based safety management system until closed. For Type A or B mishaps (greater $500,000 and/or hospitalization of personnel) a formal review board shall be appointed per the requirements of NPR 8621.1 by the Center Director or Headquarters. All type A, B, or C mishaps or high visibility D or close calls shall immediately be reported to the Director Of or Deputy Director.

**8.0 Area Inspections**

Each branch/division/office shall establish an inspection program of their work areas, which will identify area hazards and track closure of the hazards. All lab/hazardous areas shall be inspected quarterly. Office areas shall be inspection at least twice a year. Inspections may be accomplished by the area supervisor or he/she may delegate some of the inspections to be done by an employee trained on hazard recognition. Records shall be kept as to the status of the inspection and closure in the web-based safety management system. The inspection program should rotate participants, so that all employees and supervisors take part in the program. Metrics are developed to make sure trends are identified. Where trends indicate problems exist, the safety program emphasis should be modified.

**9.0 Employees Reports of Hazards**

Hazards reported by employees shall be documented and tracked in the web-based safety management system. On a quarterly basis, each branch should review the list of reports and time for corrective action. Those taking over 30 days should be investigated to determine what caused the delay and any corrective action needed to prevent future delays. Once the hazard has been corrected the employee shall be notified of the action taken. Trends should be reviewed to determine areas of concern.

**10.0 Hazard Prevention and Control**.

In order to ensure hazards are properly identified and controlled, divisions/branches have a safety representative(s), to help ensure the safety of personnel and operations. The Division level person shall be a member of the AETD Safety Committee. (See Appendix C for the duties and responsibilities of the Division/Branch Safety Representatives) Where questions exist, he/she shall contact the AETD Safety Office for guidance. Safety Representatives shall attend additional training, as necessary, to ensure they understand the safety requirements of the jobs being performed.

Engineering controls shall be implemented where feasible. Personal Protective Equipment (PPE) shall be used during the implementation of engineering controls or where engineering controls are not feasible. Branches shall identify the types of PPE needed for the work performed and maintain an adequate supply of PPE for the hazards personnel are exposed to. PPE shall only be used when engineering controls are not in place, not as a substitute of engineering controls.

Workplace hazards that require funding over the funding available to the Division shall be reported to the Deputy Director for presentation at higher levels. The Deputy Director, depending on the level of severity, may raise the issue to the appropriate Center official, and if necessary, to the Center Director level.

In order to ensure personnel have access to proper information on the general safety requirements, the Directorate Safety Manual shall be available on GDMS. When divisions need additional clarification on safety issues within their operations/facilities, an addendum shall be written. This manual shall discuss the types of hazards found in the work areas, resources for obtaining more information, processing variances specific to those facilities, use of the buddy system, etc. To ensure it is current it shall be reviewed every two years and updated as necessary.

Each building on GSFC has appointed fire and floor wardens to respond in the event of an emergency situation. The Division personnel appointed to these positions shall follow the guidance of the GSFC Incident Commander as stated in the Building Emergency Plans, located on the Protective Services web site (http://protectiveservicesdivision.gsfc.nasa.gov/emergencyBuildingPlans.html).

Certain types of jobs require medical examinations. The Division shall ensure all personnel having to wear respirators, operate cranes or forklifts, work around Class IIIB or IV lasers, etc. are medically qualified prior to use of the equipment. The Safety Manual generally states which types of work require medical evaluations.

Where critical systems, such as oxygen monitoring, exist, a maintenance program shall be established. This system shall be reviewed at least annually to ensure it is function properly. At no time shall a critical system be allowed to stay in a non-functioning state without a mitigation plan in affect.

**11.0 Training**

Personnel performing work, which is hazardous or requires training per a standard or regulation, shall have training prior to being assigned to the task. Figure 11-1 lists the minimum requirements. All managers/supervisors should audit the training their employees are required to attend to ensure they understand the safety requirements needed for safe operation.

Each Branch shall maintain a list of the training required for their personnel and the date it expires. Supervisors shall ensure certifications remain current. The “Safetrain” application can be used as an aid to determine required employee training.

Figure 11-1. Training Matrix

| Training Type | Frequency of Training | Types of jobs requiring training |
| --- | --- | --- |
| Aerial Lift | Annually | Aerial lift operators |
| Arc Flash | 4 years?? | All personnel that work on live circuits |
| Asbestos Awareness | Prior to working on equipment/facilities that may contain asbestos and every year | All maintenance, crane inspection/maintenance, and custodial employees or employees that work with asbestos impregnated materials |
| Compressed Gas Safety | 4 years | Personnel working with pressurized gas cylinders or systems over 30 psi |
| Confined Space Entry | 4 years | Personnel entering confined spaces or are attendants for confined space entry operations |
| CPR | Annually | Personnel required to perform CPR |
| Crane/Rigging | Annually | Personnel required to operate cranes or perform rigging |
| Cryogenic Safety (Basic and advanced\_) | 4 years | Personnel working with or near cryogenic liquids must have the basic class. Personnel designing cryogenic systems must take the advanced. |
| Electrical Safety Awareness | 4 years | All personnel |
| Electrical Safety | 3 years | Personnel and their supervisors that work with 50 volts or higher where there is a hazard, welders, electricians and electrical engineers are examples |
| Emergency Evacuation, includes a review of building plans, how to find updates, emergency response | Annually | All Personnel |
| Environmental Awareness | Annually | All personnel on Center |
| Explosive Handlers | 4 years | Personnel working with ordnance |
| Fall Protection | 1 year | Personnel working with harnesses and lanyards |
| Fire Extinguisher | 1 year | Personnel work as a fire watch during welding operations and when required to use on for emergency situations |
| Fire/Floor Wardens | Annually | Personnel appointed as fire/floor wardens |
| First Aid | 3 years | Personnel required to perform first aid |
| Forklift | Annually | Forklift operators |
| Hazard Communication | At beginning of employment, prior to assignment and when new hazards are introduced | All Personnel must have an awareness of the requirements. If working with or near hazardous chemicals must have formal training |
| Hazardous Waste Generator | Annually | All employees who use chemicals or dispose of any material that could be considered hazardous |
| Hearing Conservation | Annually | Personnel working in area where the noise is over 80 dbA |
| Integrated Contingency Plan (ICP) | Annually | Personnel handling storage of 55 gallons or more of oils |
| Ionizing Radiation | Prior to working with | Personnel working with or near ionizing radiation |
| Laboratory Safety | 3 years | Personnel working in chemical laboratories |
| Laser (Class IIIB, and IV) | Prior to use | Personnel working with or near Class IIIB or IV lasers |
| Lockout/Tagout/ Blockout for Affected Personnel | 4 years | Personnel who operate equipment that may have to be locked or tagged out, but do not do servicing or maintenance of that equipment |
| Lockout/Tagout/ Blockout for Authorized Personnel | 4 years | Personnel working on equipment where there can be a release of hazardous energy |
| Mishap Investigation | Prior to conducting a mishap investigation | Managers, supervisors or employees leading a mishap team |
| Nanotechnology Safety Training | Prior to work with or near loose nano-particles | Prior to use of loose nano-particles, if grinding or cutting materials containing nano-particles, maintaining equipment that has been exposed to loose nano-particles or is a first responder/FOM for areas where loose nano-particles may be. |
| Oxygen Deficiency Hazard | ?? | All personnel working in areas with asphyxiants (LN2, GN2, etc.) |
| Personal Protective Equipment (PPE) | Prior to assignment | All personnel required to wear PPE |
| Respiratory Protection | Annually | Personnel using respirators |
| Scaffold Erection Safety | 4 years | Personnel erecting or working on scaffolding |

**Appendix A** – **Definitions**

Critical Results in loss of life, loss of or damage to flight hardware, or special high dollar items, one-of–a kind articles, or major facility components, whose loss would have serious programmatic or institutional impact

Hazardous Materials or equipment that, if misused or mishandled, have a high potential to result in loss of life, serious injury to personnel, or damage to systems, equipment, or facilities.

RAC Risk Assessment Code. This is a number, which is assigned when looking at the frequency and severity of a subject. The lower the number the more hazardous the subject.

RAC 1 Imminent Danger. The situation is unacceptable and operations terminated and mitigation actions must be taken immediately.

RAC 2 Serious. The situation is unacceptable and corrective actions must be given priority to mitigate the hazard to an acceptable level. Operations should be shut down immediately and a risk mitigation plan developed.

RAC 3 Moderate. A corrective action plan should be developed, implemented, and tracked to rectify items.

RAC 4, 5, 6, 7 Minor. Items are low risk and should be corrected as part of the daily on-going operation.

**Appendix B –** **Acronyms**

AETD Applied Engineering and Technology Directorate

GDMS Goddard Directives Management System

IRIS Incident Reporting Information System

PPE Personal Protective Equipment

SRRT Safety Risk Reporting Tracking (AETD Safety web site found at “aetdsafety”)

**Appendix C**

AETD Safety Committee Charter

1. **Mission Statement:** The purpose of this committee is to provide an open forum for safety related communications between management and employees; serve as advisors to the Directorate; provide interpretation and coordination of safety issues; and oversee the health of the Directorate Safety Program. This committee shall discuss, such things as:

* Changes in safety policies/requirements
* Employee concerns
* Safety metrics
* Implementation efforts

1. **Goals and Objectives:** The Safety Committee will implement the Program goals specified in Section 1.0 of this document.The Safety Committee will ensure direct participation by Division leadership, status the health of the AETD Safety Program by examining (and if necessary improving) Program metrics, take corrective actions, and disseminate safety related information; it will determine how the Safety program can be improve and make those improvements. It will determine what additional funding is needed, and what needs to be done to ensure the best in AETD are involved in workplace safety.
2. **Meeting Schedule:** The AETD Safety committee meetings shall be held monthly for approximately one hour.
3. **Quorum Rules:** Minimum of 75% attendance of the Division Management to hold a meeting.
4. **Membership Guidelines and terms:** The Division Chief or the Division leader who is designated to speak for the division, and an employee representative who champions safety causes, shall represent each Division on the Committee. Members shall serve at least two years. The duties of the members are:
5. Monitor safety performance using the web-based data, assess where the highest risks are, and implement action plans to eliminate or reduce those risks.
6. Disseminate safety related information to each division as needed
7. On an annual basis, determine what changes need to be made to the Safety Program to maintain its good health.
8. Provide safety program coordination among the Code 500 Divisions and offices
9. Share lessons learned, positive and negative, and best practices to enhance overall AETD safety performance.
10. Ensure supervisors understand their safety responsibilities.
11. Inspire management, supervisors, employees, and contractors to improve safety performance for the next generation.
12. Assign the duties of the Division/Branch Safety representatives, which as a minimum shall be:
13. Attend all required safety related training applicable to the operations performed in their area of responsibility
14. Ensure that area inspections are performed and that employees are correcting deficiencies on a timely basis, and at least quarterly, personally attend the inspections to determine if they are being conducted as required.
15. Recommend controls to assure safe performance of all work performed
16. Disseminate safety related information to Branch personnel.
17. Help define branch training requirements and ensure that employees are trained
18. Ensure personnel have proper personal protective equipment (PPE)
19. Help in the development of appropriate Task Hazard Analysis (TSA) or Job Hazard Analysis (JHA) for all work being performed
20. Ensure hazardous operations have written procedures compliant with requirements in NPR 8715.3, reviewing and approving hazardous operating procedures as necessary
21. Collate metrics for submission to the AETD Safety Office; and finally
22. Carefully consider any need for additional procurement or FTE funding, and forward it to the Division heads or, if needed, to the Directorate
23. **Chair Selection:** The civil servant committee members shall select the chair among themselves, which may rotate between management and employees. The Director Of may choose to appoint the chairperson. The person elected as the chair should serve for no more than two years.
24. **Attendance Requirements:** Members are required to attend at least 75% of the meetings; if they cannot attend, they will delegate a competent person to represent them and ensure they are fully briefed.

**8. Meeting Minutes** **Contents:** Minutes are emailed to all meeting participants and posted on the AETD Safety Website.

* Attendance
* Action Items
* List of action items
* Status (due date, open, closed, delayed, in progress, etc.)
* Name of individual who originated the action item.
* Name of individual who is responsible for completing each action item
* Safety Data Analysis/Review (determine metrics from the following)
* Percent of inspections completed
* Number of finding by Risk Assessment Code (RAC)
* Closure time for findings
* Types of findings (electrical, hazard communication, housekeeping, trip/slip/fall, etc.)
* Safety training status (may include implementation of SAFETRAIN)
* Report summary of applicable Center level safety committees (Goddard Safety Council, Radiation Safety Committee, Electrical Safety Committee, Lifting Devices and Equipment Safety Committee, etc.)
* Any future safety events
* Mishaps/Close calls and lesson learned
* Reports of employee concerns
* Status of Goddard Safety Improvement Team action items

**9 Presentation to the Director Of:** The Safety Committee will ensure that each division is ready to brief the Director of AETD on a quarterly basis and, at a minimum, can describe and prioritize current risks, action plans, accomplishments and needs and discuss all lessons learned from mishaps.

1. **Record Keeping:** The following records shall be maintained per NRRS requirements.

* **Committee meeting minutes**
* **List of committee members**
* **List of action items with status**

**Appendix D**

**Potentially Hazardous Operations List**

The following is a list of identified potentially hazardous operations associated with AETD operations. Changes to this list will be made as other operations are identified or as the potential risk is reduced. This list in not meant to be all inclusive, but a general overview at one point in time.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Code | | | | | Type of Operation |
| 540 | 550 | 560 | 580 | 590 |  |
| X |  |  |  |  | Centrifuge operations |
| X | X |  |  |  | Confined space entry |
| X | X |  |  | X | Crane operation, both critical and noncritical |
| X | X | X |  |  | Cryogenic fluid handling |
| X | X | X |  | X | Hazardous chemical (health, flammability or reactivity hazards of 3 or 4) |
|  |  | X |  |  | High Energy Storage (Batteries) |
| X |  |  |  | X | High noise areas |
|  |  | X |  |  | Ionizing radiation |
| X | X | X |  | X | High pressure gas and hydraulic operations, test and inspection |
| X | X | X |  |  | Electrical repair, troubleshooting, and fabrication/assembly greater than 50 Volts |
| X |  |  |  | X | Explosive Handling |
| X | X |  |  |  | Laser operation, Class IIIb and IV |
| X | X | X |  | X | Lockout/tagout operations |
| X |  |  |  |  | Mobile Aerial Platform operations and maintenance |
| X |  |  |  |  | Nano-materials – working with loose or possibly loose nano-materials |
| X | X | X |  | X | Non-ionizing radiation (high intensity white light, UV, RF or IR) |
| X | X | X |  |  | Possible oxygen deficient areas |
| X |  |  |  |  | Powered Industrial Trucks |
|  |  |  |  | X | Propellant handling |
| X |  |  |  |  | Riggers for hoisting operations |
| X |  |  |  |  | Work at heights (scaffolding/use of fall protection) |
| X | X |  |  | X | Unguarded rotating equipment and machinery |
| X | X |  |  | X | Welding |

**Appendix E**

**Risk Assessment Codes**

The Risk Assessment Code (RAC) is a numerical expression of comparative risk determined by an evaluation of both the potential severity of a condition and the potential probability of its occurrence. RAC’s are assigned a number from 1 to 7 in a risk matrix. The RAC number serves as a means to prioritize corrective actions.

Severity is an assessment of the worst potential consequence, defined by degree of injury or property damage, which could occur. The severity classifications are defined as follows:

Class I – Catastrophic – A condition that may cause death or permanently disabling injury, facility destruction on the ground, or loss of crew, major systems, or vehicle during the mission.

Class II – Critical – A condition that may cause severe injury or occupational illness, or major property damage to facilities, systems, equipment or flight hardware.

Class III – Moderate – A condition that may cause minor injury or occupational illness, or minor property damage to facilities, systems, equipment, or flight hardware.

Class IV – Negligible – A condition that may cause the need for minor first aid treatment though would not adversely affect personal safety or health. A condition that subjects facilities, equipment, or flight hardware to more than normal wear and tear.

Probability is the likelihood that an identified hazard will result in a mishap, based on an assessment of such factors as location, exposure in terms of cycles or hours of operations, and affected population. The following is an example of Probability Estimation:

A – Likely to occur immediately

B – Probably will occur in time

C - May occur in time

D – Unlikely to occur

E – Improbable to occur

# Risk Assessment Code Matrix

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Probability Estimate** | | | | |
| **Severity Class** | **A** | **B** | **C** | **D** | **E** |
| **I** | **1** | **1** | **2** | **3** | **4** |
| **II** | **1** | **2** | **3** | **4** | **5** |
| **III** | **2** | **3** | **4** | **5** | **6** |
| **IV** | **3** | **4** | **5** | **6** | **7** |

**CHANGE HISTORY LOG**

|  |  |  |
| --- | --- | --- |
| **Revision** | **Effective Date** | **Description of Changes** |
| Baseline | 11/25/2005 | Initial Release |
| A | 03/27/2007 | General editorial changes throughout, update of matrix, made goals and objective measurable, and updating requirements for communicating mishap/close call lessons learned. Deleted Appendix A, Inspection/Audit Tracking Form. |
| B | 12/17/2010 | Format update, deleted the measurement on injury rates and modified goals and objectives, renamed the AETD Safety Council to AETD Safety Committee, general update to text, updated Safety Committee charter, updated training chart and hazardous operations chart. |
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