Electrical Transmission and Distribution Construction Contractors and Trade Association OSHA Partnership
Best Practices

Purpose:

As a "Best Practice Committee" we believe that properly executed Insulate and Isolate (I&I) techniques allow a line worker to safely work on and around energized equipment and conductors. The employer must ensure that each employee who performs energized line work is 'qualified' through training and experience to perform the work assigned.

It is understood by this committee that when speaking of "Best Practices Insulate and Isolate techniques," the "best practice" is much more than simply the application of rubber/plastic isolating goods or rules regarding personal protective equipment (PPE). The I&I best practice consists of multiple dynamic comprehensive facets that include but are not limited to consistent training, auditing, discipline, job safety analysis, and I&I field criteria that may show specific insulating goods application; they also demonstrate and reinforce the I&I concepts that an end user of I&I best practices would show the desired behavior on the job.

Definition of "Best Practice":

We define a "Best Practice" as a process or method that can be applied through out the electrical industry that will assist the ET&D Partnership companies in reducing the frequency of incidents.

Guidelines for identifying a "Best Practice":

1. Is this feasible for line workers to perform?
2. Is this currently being done in the industry?
3. Could this be implemented?
4. Can all partners comply with this best practice?
5. Is it repeatable?
6. Is it objectively measurable?

BEST PRACTICE

SUBJECT: ADMINISTRATIVE CONTROLS

PRACTICE STATEMENT: Injuries to personnel from improper job planning and risk assessment.

PRACTICE DESCRIPTION: Identify type and quantity of Insulate and Isolate components

A. Pre-planning to begin at the pre-bid meeting.
B. Preliminary job site analysis.
C. Contractor shall request information from the Host Employer so that the Contractor may be able to conduct adequate risk assessments prior to beginning operations.
D. Line work on conductors or equipment shall be performed when they are de-energized or a portion is de-energized and grounded when possible.

BENEFITS:

- Eliminate injuries resulting from improper planning by ensuring key job hazards are identified and controlled and provide support to contractors in obtaining needed information for effective risk assessments.

REFERENCES:
National Electric Safety Code (NESC, ANSI C2 – Part 4)

BEST PRACTICE

SUBJECT: JOB BRIEFINGS

PRACTICE STATEMENT: Provides a uniform methodology and outlines key components of job briefings.

PRACTICE DESCRIPTION: Document job sequence, hazards to be encountered, and steps taken to control/eliminate hazards by doing the following:

A. Define routine and critical tasks.
B. Identify roles & responsibilities.
C. Identify hazards.
D. Determine risk mitigation.
E. Documentation shall include I & I to be used.
F. Personal Protective Equipment to be used.
G. Emergency response information.
H. Number of briefings to be held.

NOTE: Job briefings need to be conduct when work changes significantly.

All crewmembers shall participate in a documented job briefing. Job briefings are to be held at the start of the work shift, as work tasks or hazards differ from original briefing, and as additional personnel arrive at the job site. These job briefings shall include the components of a Hazard Analysis or use your company specific hazard analysis program associated with the work steps, hazards associated with the work step, and ways to eliminate or control the hazards. The job briefing form shall have a provision for each employee to sign to verify they have participated in the job briefing. Each ET&D Partnership company's management shall establish a review process to ensure that the documented job briefing process is effective.

BENEFITS:

- Provides for essential job safety planning guidelines and lists key elements.
- Enhances compliance with OSHA regulatory requirements.
- Incorporates use of a specific hazards identification process in the job planning process that will provide for enhanced controls for risks.
- Proper pre-planning reduces the risk of injury.
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- The process and required documentation enhances inclusion and participation of job team members in the safety planning processes associated with the job.

REFERENCES: National Electric Safety Code (NESC, ANSI C2 – Part 4)

Frequently Asked Questions
Job Briefings

1. Do I have to document a Job Briefing when the tasks are repetitive?

    - Yes all Job Briefings shall be documented. The job briefing form shall have a provision for each employee to sign to verify that they understand the job briefing. If during the course of performing the planned task, conditions change that will affect the safety of the personnel, a new Job Briefing shall be conducted and documented (original document may be amended to reflect content of the new Job Briefing).

2. Do I need to do separate Job Briefings for repetitive tasks?

    - Yes a Job Briefing shall be held each day at the beginning of each shift. If during the course of performing the task the conditions change that will affect the safety of the personnel a new Job Briefing shall be conducted and documented.

3. Must I sign the Job Briefing?

    - Yes, to verify presence and understanding of the Job Briefing. When an individual signs the Job Briefing they are acknowledging an understanding of the pertinent information covered during the Job Briefing.

4. Must the Foreman lead the Job Briefing?

    - The Supervisor is always in control of job briefings however, participation by everyone is encouraged.

5. Can the form be "passed around" and everyone just look at it?

    - No. Verbal communication must take place – speaking and listening.

6. Where should the Job Briefing be conducted?

    - A Pre Job Discussion shall be conducted at the "show up". The task specific job briefing shall be conducted at the location where the task is going to be performed.

Frequently Asked Questions
Job Briefings(cont.)

7. Must I do a Job Briefing if I'm working alone, and shall it be documented?

    - Yes, in order to insure that hazards have been properly identified and that the countermeasures will be effective. This Job Briefing shall also be documented.

8. What should be done if someone who was not at the Job Briefing shows up such as an engineer, new crew member, property owner, OSHA?

    - Communicate with crew the necessary steps they must take in order to maintain personnel safety. Brief the new arrival, as necessary, with regard to the Job Briefing. Request the new arrivals signature indicating their presence and their understanding of the hazards and countermeasures.

9. Where should the Job Briefing be kept?

    - A current Job Briefing shall be kept with the crew, at the jobsite.

10. Do I need to do a Job Hazard Analysis (JHA) for every job?

    - Yes. Job briefings shall include the components of a Job Hazard Analysis or use your company specific hazard analysis program associated with the work steps, hazards associated with the work step, and ways to eliminate or control the hazards. The JHA may be included with the Job Briefing document or the JHA may be a separate document.

BEST PRACTICE

SUBJECT: PRE-USE INSPECTION OF RUBBER PROTECTIVE EQUIPMENT

PRACTICE STATEMENT: Protocols related to the effective inspection of insulating protective equipment**.**

PRACTICE DESCRIPTION:

> All rubber protective equipment shall be inspected prior to each use. All rubber/plastic insulating equipment shall be inspected for any damage, wear or contamination that would compromise its ability to insulate or isolate the linemen from different potentials. Applicable service dates shall be observed. If upon inspection insulating protective equipment is found to be defective the equipment shall be identified and removed from service.

BENEFITS:

- Provides for uniform inspection guidelines that can be applied industry wide

REFERENCES:

ASTM F478 – 1999 Standard Specification for In-Service Care of Insulating Line Hose and Covers
ASTM F479 – 2001 Standard Specification for In-Service Care of Insulating Blankets
ASTM F496 – 2002 Standard Specification for In-Service Care of Insulating Gloves and Sleeves
ASTM F1236 – 2001 Standard Guide for Visual Inspection of Electrical Protective Rubber Products
National Electric Safety Code (NESC, ANSI C2 – Part 4)

Frequently Asked Questions
Pre-Use Inspection of Rubber Goods

1. Who does this inspection?

    - A qualified crew member shall perform a pre-use inspection prior to each time insulating rubber goods are used.

2. Why are there two dates on insulating rubber goods?

    - One is the test date, and where applicable there will be an issue date.

3. Which date should I use?

    - This will depend on the contractor and state that you are working in. If you are not sure you should ask your supervisor.

BEST PRACTICE

SUBJECT: QUALIFIED OBSERVER

PRACTICE STATEMENT: Identify and utilize qualified observer for critical tasks.

PRACTICE DESCRIPTION: A member of the crew shall be identified to act as an observer to ensure clearances are maintained, PPE, and effective cover-up is installed. The observer shall be capable of the identifying nominal voltages, energized components, minimum approach distances, and proper safe work practices while crewmembers are working on energized lines.

NOTE: This section is not intended to mandate staffing requirements.

A. The term "effective cover up" is used to describe the installation of phase-to-phase rated insulating protective cover on energized conductors and/or equipment of different potentials when the lineman is within reaching distance or in areas extended by handling conductive objects.

B. The term "extended reach" is used to describe being within five feet of energized conductors and/or equipment or having a conductive object within five feet of energized conductors and/or equipment.

BENEFITS:

- Eliminate injuries from unrecognized hazards or changes in conditions.
- Clarify duties and provides guidance as to when observers are beneficial.
- Provides guidance on observer qualifications.

Frequently Asked Questions
Qualified Observer

1. What qualifications does the Qualified Observer need?

    - The observer shall be capable of identifying nominal voltages, energized components, minimum approach distances, and proper safe work practices while crewmembers are working on energized lines, give warning, and are able to initiate the emergency action plan.

2. Is a Qualified Observer needed for every task?

    - No, only during critical tasks as defined in the job briefing process.

3. Who may be a Qualified Observer?

    - Anyone crew member who meets the criteria of a qualified observer.

4. While personnel are performing critical tasks that would require a Qualified Observer, can the Qualified Observer have other duties?

    - No. While performing the functions of a qualified observer, the qualified observer shall not perform other tasks.

BEST PRACTICE

SUBJECT: INSULATE & ISOLATE SAFETY PERFORMANCE CHECK

PRACTICE STATEMENT: Review of qualification, and/or performance criteria to ensure compliance with Isolate and Insulate procedures.

PRACTICE DESCRIPTION: A safety review process shall be in place that will be performed by a competent person. Included in the review process will be assurances that the company safety rules and proper cover up procedures are being followed. Additionally, documentation such as Job Briefing forms and Job Safety Analysis forms shall be reviewed.

BENEFITS:

- Routine auditing provides for performance and regulatory assurance for critical control techniques
- Effective auditing will enable enhanced and consistent performance

Frequently Asked Questions
Insulate and Isolate Performance Check

1. Who can be a "competent person"?

    - A person designated by the employer who has the ability – by reason of training and/or experience – to identify existing and predictable hazards in the workplace and has the authority to take quick, prompt and effective action.

BEST PRACTICE

SUBJECT: CRADLE-TO-CRADLE USE OF INSULATING RUBBER GLOVES AND SLEEVES

PRACTICE STATEMENT: Protocols related to effective use of insulating rubber gloves and sleeves**.**

PRACTICE DESCRIPTION:

1. When employees are working on energized circuits or equipment using the rubber glove method, rubber protective-insulating gloves and sleeves rated for the exposure of the highest nominal voltage shall be worn cradle-to-cradle when working from an aerial platform.
   a. Rubber protective insulating sleeves are not required when employees are working circuits with a potential of 600 volts or less if there is no upper arm exposure and the worker will not encroach the 5-foot primary zone.
   b. The term "effective cover up" is used to describe the installation of phase-to-phase rated insulating protective cover on energized conductors and/or equipment of different potentials when the lineman is within reaching distance or in areas extended by handling conductive objects.
   c. The term "extended reach" is used to describe being within five feet of energized conductors and/or equipment or having a conductive object within five feet of energized conductors and/or equipment.
2. Electrical class rating of the insulating rubber sleeves shall meet or exceed the electrical class rating of the insulating rubber gloves when working on primary conductors.
3. Company policies shall apply when the above conditions cannot be met. Alternative work methods ensuring worker safety shall be identified, communicated to all affected workers, implemented and documented as part of the Job Briefing process.

BENEFITS:

- Provides specific use requirements that are proven methods for reducing electrical contact injuries and fatalities.
- Provides for uniform use guidelines that can be applied industry wide.

Frequently Asked Questions
Cradle to Cradle Gloves & Sleeves

1. Can I swing the bucket out of the energized zone and remove Gloves and Sleeves in order to smoke, dip, etc.?

    - The bucket must be repositioned to the cradle or lowered to its lowest possible elevation before gloves and sleeves may be removed.

2. Are there examples when gloves and sleeves are required, when working in a bucket (cradle to cradle) when can I remove rubber gloves and sleeves while in the bucket?

    - When the bucket has been repositioned to the cradle or lowered to its lowest possible elevation.
    - When the circuit has been deenergized, grounded and an EPZ has been established.
    - Refer to company policies for specific work procedures.

3. When ascending to perform work on a transmission line with energized under build, do I need gloves and sleeves while moving past the energized under build?

    - No, as long as the 5 ft. primary zone is not encroached.

BEST PRACTICE

SUBJECT: LOCK-TO-LOCK USE OF INSULATING RUBBER GLOVES AND SLEEVES

PRACTICE STATEMENT: Protocols related to effective use of insulating rubber gloves and sleeves**.**

PRACTICE DESCRIPTION:

1. When employees are working on energized circuits or equipment using the rubber glove method, rubber protective-insulating gloves and sleeves rated for the exposure of the highest nominal voltage shall be worn "lock to lock" when employees are working energized URD equipment.

   The term "Lock-to-Lock" is used to describe the utilization of rubber gloves and sleeves, when required, prior to the time the pad mounted equipment is unlocked until work is complete and the pad mounted equipment is relocked. Additionally, rubber gloves and sleeves shall be worn when working on or within the extended reach of the conductor or piece of equipment. The term "extended reach" is used to describe being within five feet of energized conductors and/or equipment or having a conductive object within five feet of energized conductors and/or equipment.

2. Electrical class rating of the insulating rubber sleeves shall meet or exceed the electrical class rating of the insulating rubber gloves.

3. Company policies shall apply when the above conditions cannot be met. Alternative work methods ensuring worker safety shall be identified, communicated to all affected workers, implemented and documented as part of the Job Briefing process.

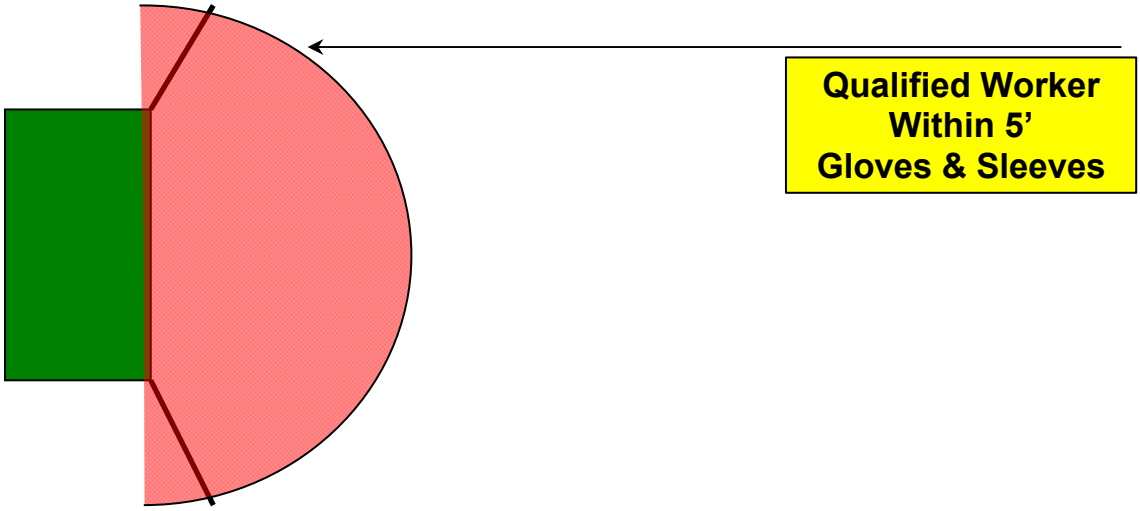
BENEFITS:

- Provides specific use requirements that are proven methods for reducing electrical contact injuries and fatalities.
- Provides for uniform use guidelines that can be applied industry wide.

Frequently Asked Questions
Lock-to-Lock

1. If I'm walking past the back of a open pad mounted transformer, do I need rubber insulating gloves and sleeves?

    - No, there is no exposure as long as the employee does not touch the cabinet.



2. Can insulating rubber gloves and sleeves be removed when terminating primary cable?

    - After secondary bushings and primary terminations have been effectively covered and the cable being terminated has been tested & grounded and the cable has been pulled beyond the face of the transformer, rubber gloves and sleeves may be removed.

3. Can I pull elbows by hand if I wear insulating rubber gloves and sleeves?

    - No. Fiberglass work sticks of six foot length (minimum) shall be used for switching in URD pad mount transformers.

4. Do I need to wear rubber gloves and sleeves to unlock and open the padmount equipment when work to be performed is to be done with live line tools?

    - Yes. Rubber gloves and sleeves shall be worn when unlocking, opening, and closing the padmount equipment regardless of the work practice to be conducted.

BEST PRATICE

SUBJECT: Rubber Insulating PPE for the Live Line Tool Method on Distribution Lines

PRACTICE STATEMENT: USE OF RUBBER INSULATING GLOVES AND SLEEVES WHILE PERFORMING DISTRIBUTION POWERLINE TASKS VIA THE LIVE LINE TOOL METHOD.

PRACTICE DESCRIPTION:

A. *When working primary voltages aloft:*

For the purpose of this document M.A.D. is defined as the Minimum Approach Distance defined by applicable Federal, State or Local regulation. M.A.D. may also be known as "Primary Contact Zone", "Minimum Working Distance, "Within Reach", "Extended Reach", etc.

This Best Practice only applies to those applications where power-line workers are utilizing the "live line tool work method" aka – "hot sticking." Workers using the "live line tool work method" ("hot sticking") use insulating tools designed and intended for use while working on energized equipment and/or conductors. Workers using the "live line tool work method" are not permitted to make direct contact with energized equipment and/or conductors with their hands and are not permitted to be in a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. as prescribed in applicable Federal, State and Local Regulatory Standards.

It is not intended nor required that the Strategic Partnership *Cradle-to-Cradle Rubber Glove Work Method Best Practice* be applicable when power-line workers are using the "live line tool work method". The *Cradle-to-Cradle Rubber Glove Work Method Best Practice* applies only when work is to be done utilizing the "rubber glove work method". When a task requires the worker to reach into, extend any conductive object into, or extend any other part of the body into M.A.D. while using the "live line tool work method," the use of rubber insulating gloves and/or rubber insulating gloves and sleeves rated the voltage are required to be used as described in this Best Practice".

Donning of such PPE shall be done in a safe location so that M.A.D. requirements are not violated. This may include repositioning of the aerial lift to its cradled position. It should be noted however, incident investigations have revealed M.A.D. violations have occurred during "live line tool work method" operations. The intent of this Best Practice is to eliminate both M.A.D. encroachment violations and subsequent injuries.

Approved June 3, 2008

Effective Date: December 31, 2008

Live Line Tool Method

1. Rubber insulating gloves and sleeves are not required when working from a position where the worker cannot reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. while using fiberglass insulating live line tools ("hot stick" method).

2. Before getting into a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D., approved protective equipment shall be used to insulate and/or isolate energized conductors and/or parts.

3. Rubber insulating gloves shall be worn when tasks require the worker to reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. when there is no upper arm exposure, even when proper cover is utilized.

4. Insulating rubber gloves and sleeves shall be worn when tasks require the worker be in a position where the worker can reach into, extend any conductive object into, or extend any other part of the body into the M.A.D. when all the above precautions have been taken and upper arm exposure still exists.

BENEFITS:

- Provides specific use requirements that are proven methods for reducing electrical contact injuries and fatalities.
- Provides for uniform use guidelines that can be applied industry wide.

Approved June 3, 2008

Effective Date: December 31, 2008

Frequently Asked Questions

Rubber Insulated PPE and the Live Line Tool Method

FAQ: When operating GOAB switches from the ground do I need gloves and sleeves?

A: No, just rubber insulating gloves are required.

FAQ: What is "upper arm" exposure?

A: When working within reach or the extended reach of the M.A.D. of energized conductors or parts, the area on the arms not protected by rubber insulating gloves that would be covered by rubber insulating sleeves.

FAQ: I'm wearing rubber insulating gloves and the conductor is covered, do I need rubber insulating sleeves?

A: No, if no upper arm exposure. Yes, if upper arm exposure exists.

Insulating rubber gloves and sleeves shall be worn when tasks require the worker to enter the M.A.D. and there is the potential of upper arm exposure regardless of the whether the conductors and equipment are covered. Covering of conductors and equipment add an additional barrier or safe guard but is not considered the primary form of protection for the worker.

FAQ: I am performing "hot stick" work and need to encroach M.A.D. and perform a task by hand. What position do I need to be in to don my rubber insulating gloves or gloves and sleeves?

A: Performing "hot stick" work method does not require the use of rubber insulating gloves or gloves and sleeves. If during this operation a task requires the worker to enter into the M.A.D., rubber insulating gloves and/or gloves and sleeves shall be donned prior to encroaching the applicable M.A.D. The worker shall maintain or move to a safe position so not to encroach M.A.D. during the donning of the PPE.

Frequently Asked Questions

Rubber Insulated PPE and the Live Line Tool Method

General Use of Insulating Rubber Gloves and Sleeves

Note: Although rubber insulating gloves and sleeves are not normally required when utilizing "hot sticking" work method the following is provided for informational purposes only.

1. Insulating Rubber gloves shall never be worn inside out or without leather protectors. They shall be exchanged at any time they become damaged or the employee to whom they are assigned becomes suspicious of their condition.
2. Leather protectors or overgloves shall not be worn except over insulating rubber gloves.
3. Insulating rubber gloves and sleeves rated at the highest nominal anticipated voltage shall be worn any time required by supervision.
4. Dielectric testing dates of insulating rubber gloves and sleeves shall be current.
5. Insulating rubber gloves and sleeves shall be visually inspected and gloves shall be air tested before each use.

Subject: Best Practices Implementation Plan

What	Who	When	Where	How
Communicate BP to EEI members.	EEI	30 days from executive approval date *.	To all EEI members	Via EEI executive member.
Post BP on Partnership recognized websites.	TT4	30 days from executive approval date *.	Appropriate Websites	Electronically available to all partnership members.
Communicate BP to NECA Line Contractors and Chapters	NECA	30 days from executive approval date *.	To all NECA Line Contractors and Chapters	Via NECA executive member.
Communicate BP to Partnership members.	Partner Contractors	30 days from executive approval date *.	In House	Via Company Executive member.
Communicate BP to IBEW Outside Local Unions.	IBEW	30 days from executive approval date *.	To all IBEW Outside Local Unions	Via IBEW executive member.
Introduce BPs to Crews and capture questions and suggestions	District Managers/ Operations Managers/ Safety Supervisors	Within 60 days from the approval date *.	In the Field	Mandatory Safety Meeting
Include BP's in New Hire Orientation.	Respective Managers	Within 60 days from the approval date *.	At the new hire orientation.	Via New Hire Introduction Process

What	Who	When	Where	How
Pre-requisite Training developed and delivered as necessary.	Qualified training personnel.	Within the time frame defined by the **effective date**** set by the Executive Committee.	At necessary locations.	As directed by TT2, or Executive Committee.
Field Implementation of Best Practices.	All Managers	Within the time frame defined by the **effective date*** * set by the Executive Committee.	In the Field	Mandatory Safety Meeting; Copy of BPs with Response to Questions and Suggestions Included and all necessary training as applicable to the given Best Practice.
Best Practice implementation & verification.	Managers and Safety Personnel	Initial and Annually.	In the Field	BP implementation scorecard.
Update Safety Manuals	Contract Member	ASAP	Within each Partner organization	By their own methods.
Communicate Response about given Best Practice from Field Ops.	Respective Managers	Initial response ASAP when a Best Practice is accepted by the Executive Committee.	Managers' communication with field ops.	Task Team 3 representative
Develop Response to Questions/Concerns and Suggestions.	Task Team 3	60 days from the time that questions and suggestions are received by TT 3.	OSP meetings	Response to the Steering Committee, and through OSP communication channels.

* Approval Date: Date BP approved by the Executive Committee

** Effective Date: The date set by the Executive Committee that an approved Best Practice shall be initiated.

Best Practice Implementation Scorecard

Partnership Member / Company: _____ Date: _____

Best Practice Name: _____

Effective Date of Best Practice: _____

Implementation Schedule

Introduce Best Practice to supervision and crews. Capture questions and suggestions.

Completed in 60 days from effective date:

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed

Date to be completed if not 100% : _____

Introduce Best Practice in "New Hire" orientation package.

Completed in 60 days from effective date:

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed

Date to be completed if not 100% : _____

Develop and communicate response to questions and suggestions.

60 days from the time that questions and suggestions are received by TT 3.

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed

Date to be completed if not 100% : _____

Best Practice prerequisite training completed. (As defined by the Best Practice)

Within the time frame defined by the **effective date*** set by the Executive Committee.

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed

Date to be completed if not 100% : _____

Field Implementation of Best Practice

Within the time frame defined by the **effective date*** set by the Executive Committee.

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed

Date to be completed if not 100% : _____

Best Practice total compliance field audit.

_____ % Total Completed

_____ # of Management _____ % Completed

_____ # of Supervision _____ % Completed

_____ # of Crew members _____ % Completed

Date to be completed if not 100% : _____