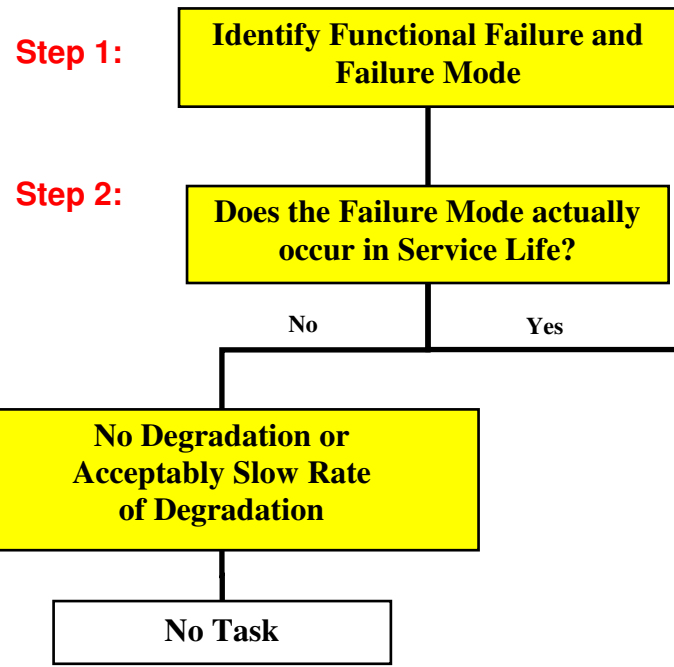
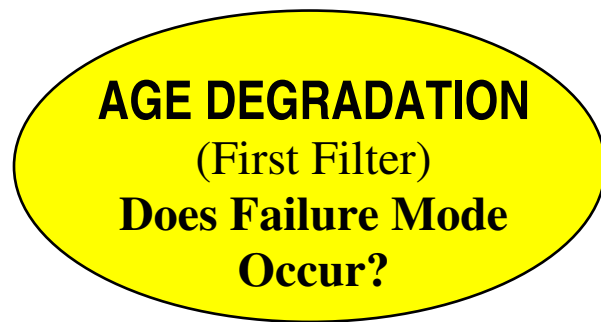


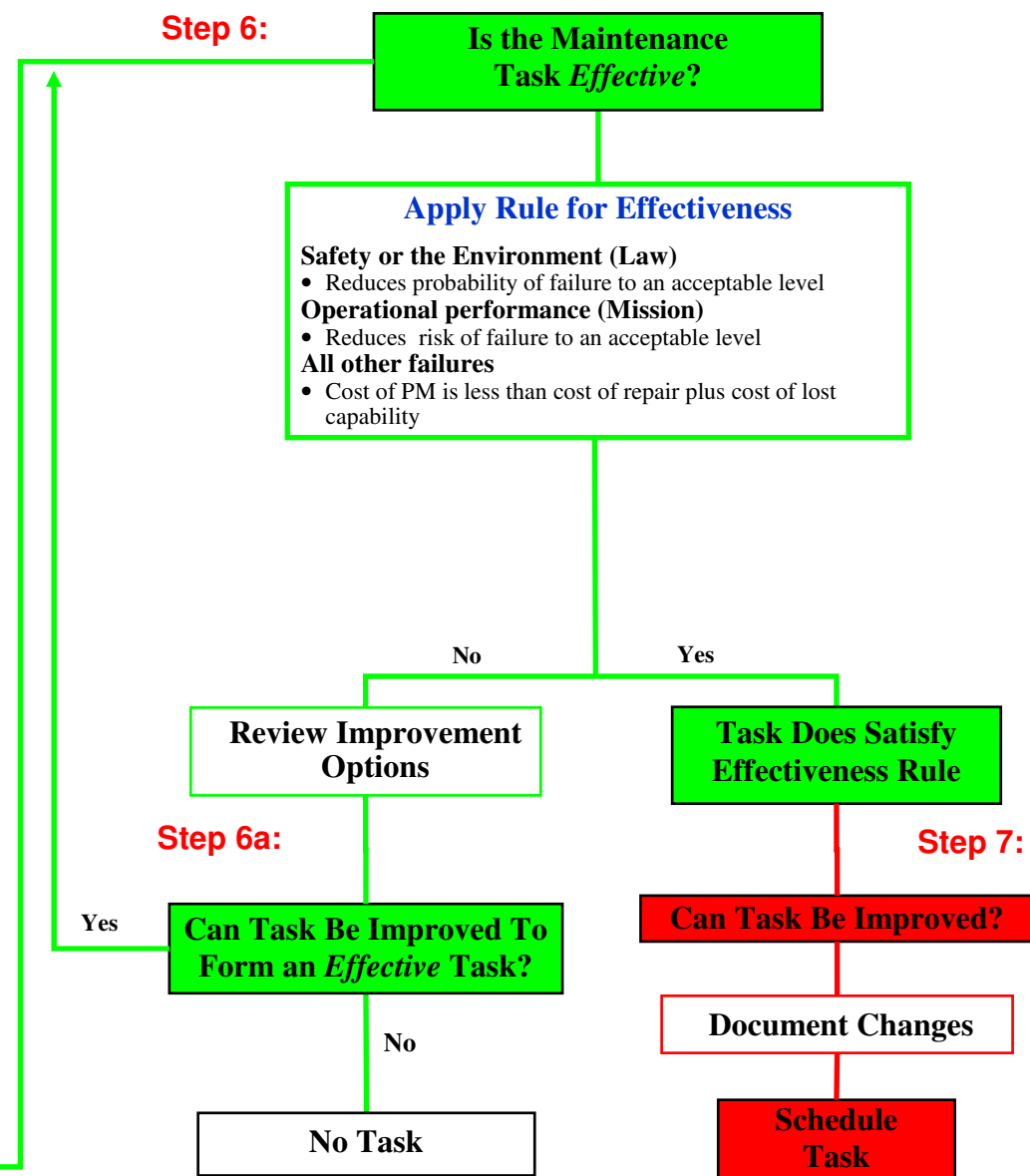
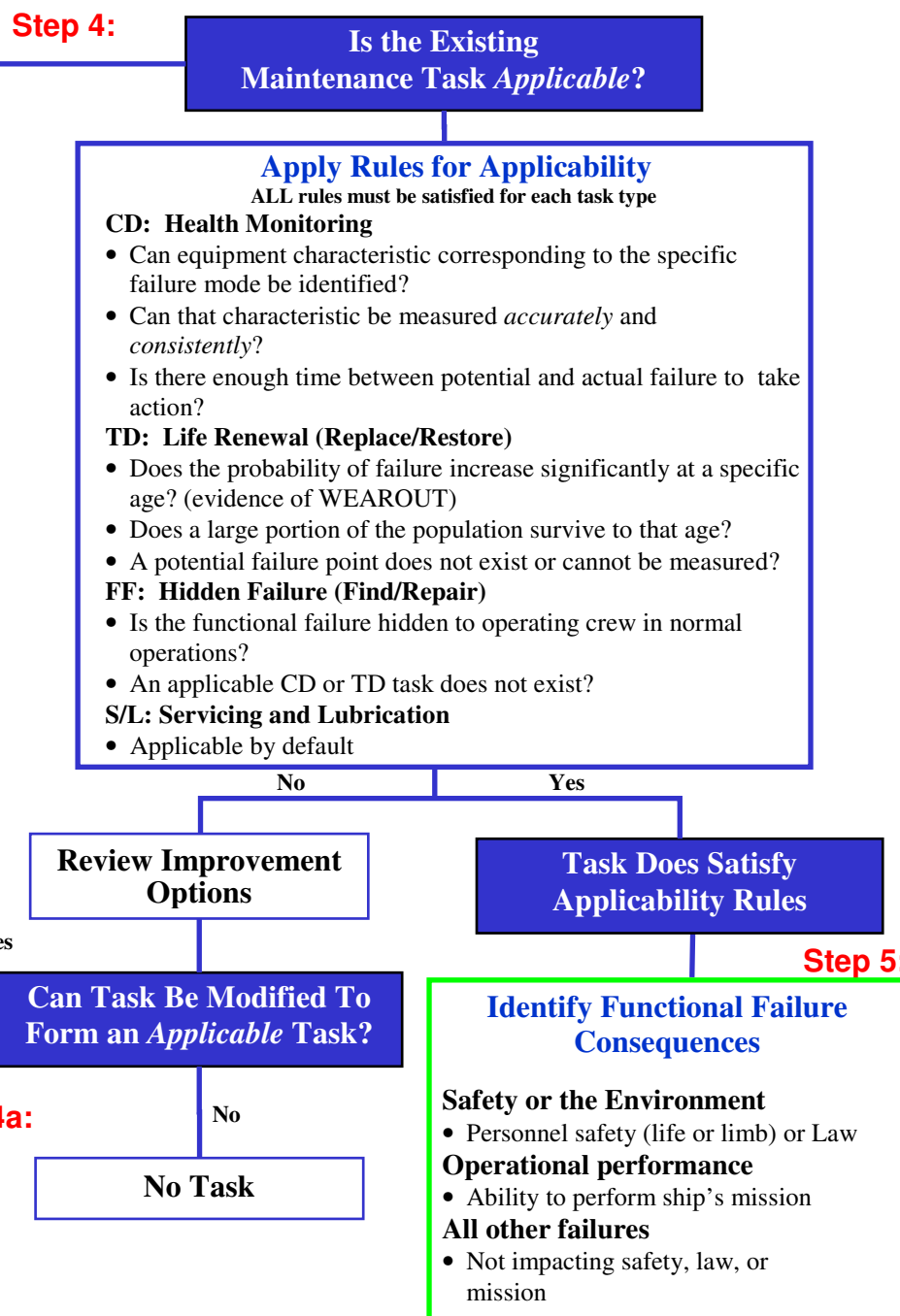
“Backfit” RCM Road Map



Step 3:

Determine/Classify Type Task

Name	CONDITION DIRECTED (CD)	TIME DIRECTED (TD)	FAILURE FINDING (FF)	SERVICING (S)	LUBRICATION (L)
Action	“Renew Life” (restore/replace) Based on measured condition compared to a standard	“Renew Life” (restore/replace) regardless of condition	Determine whether a functional failure has already occurred	Add/replenish consumable (e.g. windshield washer fluid)	Oil, grease, or otherwise Lubricate
Circumstance	Equipment characteristic corresponding to potential failure	Imminent wearout	Failure of off-line or “hidden” function (e.g. safety/ protective devices)	Reduced level of operating consumable	Accelerated wear



“Backfit” RCM Analysis Process Steps

1. **Identify the functional failure and failure mode each task is intended to prevent**
 - Functional failure = unsatisfactory condition
 - Failure mode = material condition after failure
2. **Evaluate age-reliability relationship of equipment**
 - Based on operational experience, does this failure mode actually occur?
 - Info sources/data are best, valid practical experience is OK.
 - Folklore and mythology are out.
3. **Classify the task**
 - Time-Directed (TD), Condition-Directed (CD), Failure-Finding (FF), Servicing (S), or Lubrication (L)
 - This forms the basis for applying the Applicability rules
4. **Apply rules for Applicability**
 - Failure to meet any rule requires change
5. **Identify Failure Consequences**
 - Consequences are: Safety/Law, or Mission, or All Others
 - This forms the basis for applying the Effectiveness Rule
6. **Apply rule for Effectiveness**
 - Failure to satisfy appropriate rule requires change
7. **Develop recommendations for change**
 - Applicable and Effective tasks CAN still be improved, see following recommendations.

“Backfit” RCM Task Improvement Options

- ◆ **Applicability**
 - Change task type (e.g. TD to CD)
 - Change scope/requirements (standards/procedure)
 - Change measure of age (operating hours, start/stop)
 - Fix when failed (non mission critical)
 - Delete maintenance administrative procedures from PMS or CMP.
- ◆ **Effectiveness**
 - Extend periodicity
 - Change scope/requirements (standards/procedure)
 - Change measure of age (operating hours, start/stop)
 - Combine with related tasks
 - Fix when failed (non mission critical)
 - Perform as operational tasks outside of PMS
 - Use sampling vice 100% inspection of population

RCM Task Validation Terms

- Age Degradation** – Evidence of decreased resistance to failure with increased age.
- Applicable Task** – A task or group of tasks is applicable, if and only if, it really does prevent, discover or reduce the impact of the failure mode in question.
- Effective Task** – A task that “pays for itself” by meeting the rule related to its failure consequence.
- Failure Mode** – Material condition of an item after failure (i.e., seized bearing)
- Functional Failure** – Any unsatisfactory condition, from inability to meet required performance standard to complete loss of function

Other RCM Terms

- Age:** The most appropriate measure of wear on equipment; may be measured by calendar time, duty cycles, operating hours, etc.
- Age-Exploration:** The process of systematically extending and evaluating task intervals to determine the optimum periodicity.
- Dominant Failure modes:** The failure modes which account for a significant portion of the failures of an equipment in service. For example: Worn mechanical seal in pump.
- Hidden Failure:** Functional failures whose effects will not be evident to the Operator/Maintainer during normal operation.
- Maintenance:** Actions taken to ensure that components, equipment and systems provide their intended functions when required.

NOTE: Maintenance is designed to preserve function, not eliminate the risk of failure. You can minimize risk but you *cannot* eliminate *all* failures.

- Potential Failure:** An identifiable physical condition which indicates that a functional failure is imminent.
- Reliability-Centered Maintenance (RCM):** A method for determining preventive maintenance requirements based on the analysis of the likely functional failures of hardware having a significant impact on safety, operations and support functions. RCM provides the rules of evidence of Condition Based Maintenance (CBM)
- Risk:** Probability of failure times Severity of failure ($P_f \times S_f$). Both Severity and probability of failure must be evaluated objectively for best long term results.
- Wearout:** The point at which an item has no service life remaining and it must be restored or replace.

For more information contact the
MSC Maintenance Management Systems Branch Head

“Backfit” RCM Analysis Process



Maintenance Effectiveness Review

“Continuously Improving Your Preventive Maintenance Program”

Figure 2