**THIS DOCUMENT INCLUDES COMPILED INFORMATION AND COLLECTED DURING T2WG MEETING #3 (green text) AND MEETING #4 (blue text)**.

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## Commission Staff Clarification on Degraded Performance Baselines

From document provided for Meeting #4:

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The following clarifying policies are part of the definition of an existing conditions baseline for use within a deemed or calculated savings determination:

* An existing conditions baseline reflective of poor maintenance and disrepair applies only to BRO installation types.
* All activities and installations that restore equipment performance to its nominal efficiency (i.e., rated, intended, or original efficiency) but do not enhance the nominal efficiency must classified as BRO, and where applicable should adhere to the HOPPs Ruling and with the guidance presented on page 26 of this Resolution (in the subsection titled Repairs Including Replacement of Failed Add-On Equipment). However, we allow for Program Administrators to submit proposals for exceptions to this rule for Commission Staff review and approval.

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* Improved operation – In this case, the high-efficiency measure is nominally more efficient than the pre-existing system as demonstrated by an increase in name plate efficiency or an improvement in the operational specifications of the equipment.
* Restored operation – In this case the high-efficiency measure restores the pre-existing equipment efficiency. These measures entail like replacement of equipment, repair of equipment, or non-hardware operational changes.

We find these definitions offer a useful reference and language for articulating standards, and determining the appropriate installation type for measures. For these reasons, we adopt them.

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Consistent with current policy, a like-for-like replacement of failed add-on equipment does not qualify for existing conditions baseline, with these exceptions:

* Use of NMEC, RCT/experimental design to measure savings
* Offered through a BRO program or under the repair and maintenance provisions outlined in HOPPs

The replacement of broken or poorly performing add on equipment may qualify as a normal replacement, and may use a code or industry standard practice baseline, as appropriate.

Order

1. For deemed and calculated savings determinations, we direct the Program Administrators to ensure that the nominal efficiency used as an existing conditions baseline will reflect the efficiency rating, designed efficiency, or original efficiency of well-maintained and properly configured equipment for all measures, except those classified as behavioral, retrocommissioning and operational (BRO). If nominal efficiency is not available, Program Administrators shall apply reasonable upward adjustment to the assumed annual energy consumption of the installed equipment to reflect the maintenance and operations component of savings. Energy Star estimates that low cost operations and maintenance savings are between 5 and 20% per year. This is a reasonable estimate, provided it is consistent with O&M savings claims for similar building and measure types.

2. We direct the Program Administrators to ensure that all program activities and installations resulting in performance that does not exceed the nominal efficiency (i.e., rated, intended, or original efficiency) of the pre-existing condition are offered through a behavioral, retrocommissioning or operational program framework, with an effective useful life not to exceed three years.

4. We direct the Program Administrators to apply a normal replacement baseline where the existing equipment is not operational or not meeting the existing service requirements. This applies to all types of equipment, including add-on equipment.

## Stakeholder Discussion on Topic

Notes from 5/10/17:

**Stakeholders agreed that may be inconsistent language or unclear intent on whether broken equipment should be eligible for an dual baseline [ACTION] Need to clarify the intent of the resolution language on what is allowed for broken or equipment performing sub-optimally.**

Jeff – Typical example of Repair-indefinitely is the boiler that gets repaired over and over. Used to be that if age > EUL the equipment would auto be disqualified. NOW, that equipment can be repair-indefinitely IFF pre-qualified

Jeff – Age/EUL should not be the only factor to determine whether equipment is eligible for replacement (point of repair opportunities); need to consider history of repair, cost of repair, how long until it is broken again; there are important differences for industrial

**Paden –** add-on equipment should not have the operational requirements; e.g., if the add-on equipment is broken (not the primary equipment); repair of broken add-on equipment should quality has repair-eligible after it has been non-operational for a period of time (e.g., 1 year). This would show the customer is likely not planning to fix the equipment.

Jesse – consider different scenarios; e.g. industrial customers have onsite mechanics who can repair equipment indefinitely

Ryan – we need to differentiate between equipment that is broken and still meeting needs from equipment that is broken and not meeting needs (argument for cases where existing baseline is appropriate)

Keith – max EUL by policy is 20 years (with some exceptions); max RUL is 10 years; Staff have authority to change in special cases <follow up>>

Leonel - we are missing data on persistence, so we don’t have data that demonstrates how long these equipment last.

**PROPOSAL**  **(Jeff)** **–** Repair-Eligible would be have to be class of equipment types that are pre-qualified ( based on evidence) for early retirement / repair-indef. Equipment type must be pre-qualified with evidence that this type of equipment is commonly repaired rather than replaced.

**PROPOSAL (Rob/SCE)** **–** combine repair-eligible/indefinitely into one category

* Rich – reasons for separating: indefinitely means the equipment is likely to operate in existing condition indefinitely .. impacts the baseline, existing conditions should be baseline in perpetuity . (If not baseline for full EUL, then assume RUL = 2/3 EUL?); there is an option to provide evidence for longer EUL (Leonel)

[ACTION] Interested parties should share additional edits/proposals

Ryan/PG&E – doesn’t understand why this would get to dual baseline.

**PROPOSAL –** Get rid of repair-eligible. If something needs repaired, then use the Standard Practice baseline using information about what options the customer has.

[ACTION] Need to get clarification on whether “not operating” is allowed in this definition or must go to normal replacement.

**Notes from 5/24/17**

See [PPT Slides with summary and resolution language for Task 3 Items](http://t2wg.cadmusweb.com/Documents/Meeting%204%20-%20Post%20Meeting%20Materials/T2WG_20170524_MeetingPresentation_wNotes.pptx)

Jeff – Do we need separate names or can these both be combined into a single wider defined category in terms of treatment in submissions of proposals for treatment of projects/measures as repair eligible or repair indefinitely? Or are there good reason to keep separate and consider proposals in a separate manner?

* Christie – We should consider keeping separate names to distinguish
* Rich – wants to make sure that there is criteria such that equipment not on a pre-approved list can still qualify as repair in-definitely. E.g., “If the equipment meets XX criteria, then it is repair-indefinitely.”
* Jeff wants a process where projects are proposed ahead of time; criteria may be established that defines the set of criteria. Wants a submittal (e.g., a workpaper) that defines a set of criteria and
* Rich – agrees to a process to defined a class of equipment as repair-indefinitely. But ALSO need to have a set of criteria to determine whether equipment found in the field may qualify. **It is the job of Task 3 to define these criteria.**
* Staff Clarification – The intent of the repair eligible-repair/indefinitely categories is to remove the limitation of EUL; i.e., to allow a pathway for equipment that is older than its EUL. The intention is not to automatically allow these equipment to qualify as early retirement.
* Rich disagrees --- his understanding is that the definition and intention of repair”… then it is that its’ automatically AR.
* Spencer – concerned that approving classes of equipment is an inefficient process. We (implementers) want to have a class of criteria by which to identify whether a project qualifies as repair-e/i

**T2WG Proposal (Jeff) –** Eliminate repair-eligible as a category because broken equipment is not eligible. This leaves us with only repair-indefinitely.

* Comments
  + We should protect from unintended consequence of being able to use a repair state as a baseline for equipment that is not operational. <<follow up with Ryan>>

**Clarification** – Measures/projects may qualify as repair-eligible by:

* Pre-qualification for classes of equipment proven to meet Task 3 criteria defined by T2WG
* OR
* Case-by-case qualification for measures/projects that meet with Task 3 criteria defined by T2WG

**T2WG Proposal (**Proposed by Spencer, Staff agrees**) –** If the equipment meets the Repair-Indefinitely criteria (see potential proposals below), then the equipment viability component of POE is satisfied. Repair-indefinitely must still satisfy the PROGRAM INFLUENCE component of POE (defined in Task 2)

## Task 1 – Proposal #1 for Repair Eligible/Repair Indefinitely Qualification

Developed by Rich Sperberg, OnSite Energy

These criteria intended to apply to equipment on a case-by-case basis, not necessarily for a market or class of equipment)

**Background/Implementer Observations:**

Resolution E-4818 analyzes Repair Eligible and Repair Indefinitely cases and assumes “Rational decision-making” to Customer decisions, but Customer decisions affected by many factors, e.g.:

1. Availability of expense versus availability of capital dollars and process for allocation of capital.
2. Knowledge of options for replacement versus repair.
3. History of Customer approach to equipment repair versus replacement.

Challenge is to provide resources and incentives to encourage replacement of equipment with more efficient equipment/systems rather than repair existing equipment. Proposal is to simplify qualification for incentives/3P Programs for repair eligible and repair indefinitely opportunities.

**Repair Eligible Criteria/Definition/Straw proposal**

1. Existing equipment is not operating (not meeting Customer requirements)
2. Existing equipment can be repaired to meet Customer requirements. Estimated cost of repair is available.
3. Alternative exists to replace equipment with more efficient new equipment and improve system efficiency (e.g., add controls and/or other system improvements)
4. Payback of replacement versus repair can be determined.
   1. Payback is Cost of new equipment option minus Cost of repair of existing equipment divided by system energy savings of new equipment/system improvements.
   2. Energy savings is existing equipment performance (energy use) prior to failure (if measurements available) or nominal efficiency/performance (energy use) of existing equipment (if measurements not available) minus efficiency/performance (energy use) of new equipment, including system improvements (as measured in post-project M&V). Nominal efficiency of existing equipment (if measurements are not available) would be determined as degraded performance as appropriate and justified.

Incentives paid per applicable program rules based on incremental cost of new equipment/system improvements (Incremental cost is cost of replacement/system improvements minus estimated cost of repair)

If repair would extend life of existing equipment for DEER EUL, no dual baseline – EUL of replacement equipment determines life cycle savings

If repair would extend life of existing equipment less than DEER EUL, apply Dual baseline with second baseline as Code.

If existing equipment is connected to other energy using equipment, a separate determination of repair/replacement of that equipment would be made at the time of failure or accelerated replacement of that equipment.

1. Existing equipment is operating and meeting Customer requirements
2. Existing equipment not in imminent failure mode (as verified at pre-inspection or per program rules)
3. Retrofit/Replacement identified in audit
   1. Internal Customer audit
   2. 3P Audit/Project Feasibility Study (PFS)
   3. Other Program audit/assessment
4. Existing equipment can be repaired to extend life for “foreseeable future”, e.g.:
   1. Re-wind motor
   2. Overhaul of compressor/chiller/pump/etc.
   3. Replace burned out lamps with like-for-like

Incentives paid per applicable program rules based on full replacement equipment/system improvement costs

No dual baseline – EUL of replacement equipment determines life cycle savings.

If existing equipment is connected to other energy using equipment (e.g. pump if pump motor is being replaced as repair indefinitely), a separate determination of repair/replacement would be made at the time of failure or accelerated replacement of that equipment.

### Comments

* Rob/SCE – broken add-on equipment belongs in BRO, not Repair-Eligible; Paden agrees (e.g., boiler economizer)
* Consider tiered requirements and levels of rigor based on size/type of project (both Rich and Paden’s proposals assume large projects)
* Jeff – need more on program influence; equipment cannot be part of a planned replacement program; General statement about classes of equipment is not sufficient
* Kay – criteria need more specifics (too “squishy”)
* PAs need to provide evidence for these classes of equipment to “pre-qualify” whole classes of equipment) OR equipment may be approved on a case by case basis if it meets the Task 3 defined criteria.

## Task 3 – Proposal #2

Developed by Paden Cast, SCG - Proposal is generally focused on heavy industrial equipment; comparable to a full-rigor approach

“Repair Indefinitely” is an equipment designation that allows functional long-lifecycle equipment to be considered for the Accelerated Replacement measure category beyond the 20 year CPUC maximum EUL limit. This designation would alter the EUL and RUL values to predetermined values (based on equipment categorization) and allow for dual-baseline consideration.

Repair Indefinitely is a status ascribed to an equipment in a facility where the following is true:

1. The equipment/process was designed such that regular and periodic maintenance is sufficient to maintain a constant level of service (DESIGN); and
2. The expected cost of equipment replacement far exceed the cost of regular and periodic equipment maintenance to provide a constant level of service (COST); and
3. the CPUC maximum EUL of 20 years does not correctly describe the full equipment useful life of the equipment as the customer intends to operate it (LIFECYCLE); and
   1. The existing system was the ISP design at the time of development (BEST AVAILABLE AT DEVELOPMENT); or
   2. The facility replacing the existing system requires an extensive capital approval process that is intended to restrict the replacement of functioning equipment (BURDENSOME INTERNAL APPROVAL PROCESS)

Recommended EUL/RUL values:

For Heavy Equipment (Units designed with ≥20 Functional Useful Life at design outset):

EUL: 20 years

RUL: 13 years (2/3 EUL)

For non-Heavy Equipment (Units designed with <20 Functional Useful Life at design outset)

EUL: 10 years

RUL: 6.7 years (2/3 EUL)

Evidentiary Standard

1. Historical capital budget planning documentation (prior to project) that indicates equipment-specific maintenance outlays AND Invoices of equipment-specific maintenance outlays; or
2. Lifecycle design documentation that indicates that the equipment was designed to operate for a period exceeding 20 years; or
3. In house engineering analysis comparing repair vs replace (internal) AND estimated associated costs; or
4. Historical evidence of regular maintenance AND at least one documented instance of significant repair activities to critical systems that extends the life of the equipment; or
5. External scoping documentation regarding equipment-specific repairs AND cost estimates for repairs AND cost estimates for replacement; or
6. Evidence that the unit is “grandfathered” under AQMD rules AND scoping documentation for impending repairs AND cost estimates for repairs AND no AQMD violations that indicate that modifications to the existing equipment are intended for emissions compliance purposes; or

## T2WG Action Items

[ACTION] Need to clarify the intent of the resolution language on what is allowed for broken or equipment performing sub-optimally.

[ACTION] Interested parties should share additional edits/proposals

[ACTION] Need to get clarification on whether “not operating” is allowed in this definition or must go to normal replacement.

[ACTION] Stakeholders should provide comments/suggestions on the equipment viability criteria to address concerns/discussions from Meeting #4