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Memorandum

U.S. Department of Transportation
Federal Aviation Administration

Subject: INFORMATION: Regulation of the Configuration, Maintenance, and Procedures (CMP) Standard for Extended-Range Twin-Engine Airplane Operation (ETOP) Suitability Approved Airplanes

Date: APR 03 1990

From:

Reply to Attn. of

To: Manager, Transport Airplane Directorate, ANM-100
Manager, Engine and Propeller Directorate, ANE-100

Director, Aircraft Certification Service, AIR-1

This memorandum is to clarify the position of the Transport Airplane Directorate and the Engine and Propeller Directorate with regard to controlling the CMP standards of ETOP airplanes and the use of airworthiness directives (AD) for that purpose.

Background

In June 1988, the Northwest Mountain Region, Assistant Chief Counsel questioned the legality of mandating future revisions to the ETOP CMP standards via Operations Specifications (OPS SPECS). They suggested that either rulemaking or AD action was more appropriate. Flight Standards position, as we understand it, is that OPS SPECS can and have been used to mandate CMP standards and subsequent revisions thereto.

Since that time a number of memorandums, briefing papers, and telecons have been generated on the issue of using an AD to mandate changes to the CMP standard versus mandating via OPS SPECS, and how to effectively correct an unsafe condition in ETOP. This issue is still unresolved and much confusion exists. If a potentially unsafe condition was to arise in ETOP today that was not limited to one U.S. operator where certificate action can be taken, the FAA could not respond in an appropriately expeditious manner using the OPS SPECS approach. Similarly, in a case where the threat to safety is not obvious by traditional measures, the AD process could be hampered unless there is agreement on the unique safety related aspects of ETOP that would justify AD action.

Discussion:

The original issue raised over the legality of mandating CMP standard changes via OPS SPECS is not really pertinent to our directorates' position. The AD process is the appropriate vehicle to effect changes to the CMP standard when an unsafe condition, such as degrading reliability, exists or is likely to develop in ETOP. In order to avoid confusion there are a number of key points that must be clarified, which are:

CMP Standard

The CMP standard is a certification requirement which establishes the minimum type design requirements to make the airplane suitable for ETOP. It should be noted that the term "CMP standard" as used here and in Advisory Circular (AC) 120-42A is not to be confused with the term "CMP document." The use and abuse of the "CMP document" by industry and FAA has lead to much of the confusion over this issue. The "CMP standard" may or may not be identified in one document.

The CMP standard is composed of service bulletins, service letters, manual references, and other pertinent documents which define the alterations, maintenance or operational requirements, and limitations determined to be mandatory in order to make the airplane type design suitable for ETOP. The CMP standard is approved by the Transport Airplane Directorate as one part of the Airplane Assessment Report (with the concurrence of the Propulsion System Reliability Assessment Board, AIR-1, and AFS-1).

The CMP standard is an amendment to the type design. It is not necessary to issue a Supplemental Type Certificate or to mandate the original CMP standard approval by AD to make it a part of the type design. The initial CMP standard and airplane suitability approval, as a change to the type design, is analogous to other type design approvals for specific operations such as CAT III autoland approval for autopilot systems that may, or may not, involve later design changes to a previously certified system.

The CMP standard is controlled through the airplane type certificate data sheet (TCDS) and the flight manual (AFM) by reference to one or more documents containing the CMP standard. Even though the CMP standard may contain maintenance actions, minimum equipment list restrictions, etc., that does not mean it is not type design related. Such items are no different than instructions for continued airworthiness, certification maintenance requirements (CMR), or electronics time-limited-dispatch criteria currently controlled by the type design under FAR Parts 33 and 25.

As a minimum, the CMP standard should not be changed unless the reliability of the airplane/engine is not achieving or maintaining the reliability objective of ETOP, or some other unsafe condition arises. As with any type design, minor changes and routine enhancements are permitted to be incorporated by manufacturers and operators through service bulletins or productions design changes. Such enhancements are not mandated as a part of the baseline CMP standard. However, a large part of today's confusion has resulted from manufacturers making changes to their document which contains the CMP standard that have not been necessary to maintain the minimum level of safety defined in AC 120-42A. It then becomes difficult for owner/operators and FAA to keep track of the true CMP standard baseline requirements. This issue has yet to be resolved between FAA and industry.

Continued Airworthiness Responsibility

The FAA has a worldwide responsibility to ensure the continued airworthiness of U.S. products and of foreign products operating in the U.S. For the most part, there is no foreign equivalent of OPS SPECS which could be used to mandate CMP standard changes on overseas operators. Foreign authorities have stated on several occasions that the only FAA means they recognize of mandating a change in type design, and thus to the CMP standard also, is an AD. They also stated that an AD is the most reliable and consistent means of bringing the need for and urgency of a change to their attention.

Advisory Circular 120-42A, Paragraph 8.g. states:

> "Type Design Change Process. The FAA directorate responsible for the certification of the type design will include the consideration of extended range operation in its normal monitoring and design change approval functions. Any significant problems which adversely effect extended range operation will be corrected. Modification or maintenance actions to achieve or maintain the reliability objective of extended range operations will be incorporated into the type design CMP standard document. The FAA will normally coordinate this action with the affected industry. The AD process will be utilized as necessary to effect a CMP standard change. The current CMP standard will be reflected in Part D of each ETOPS operator's operations specifications."

As indicated in the above excerpt from the AC, the directorates are responsible for the continuing airworthiness of the type design CMP standard. The use of the AD process already includes

the necessary coordination with industry and with Flight Standards through the respective directorate aircraft evaluation group (AEG).

Safety

Safety takes on a new additional perspective in ETOP which must be recognized under FAR 39. Admittedly, due to the many variables, it is an issue of judgement as to what factors in the ETOP environment can lead to an unsafe condition. However, our directorates have the knowledge and expertise to make those determinations, and we have done so many times in the past. Also, the guidance in AC 120-42A, based on experience and detail engineering scrutiny by industry experts, foreign authorities, and FAA, provides an adequate basis for judging safety through reliability, in addition to all the existing safety considerations we apply under FAR 39.

A question has arisen whether the lack of reliability in ETOP constitutes an unsafe condition that is likely to exist or develop in other products of the same type design. Though not explicit in the regulations, many certification requirements have evolved to their present state based on the intended operation of the product. Certification test cycles are tailored to representative, conservative, flight cycles. Life limiting of parts often assume some weighted distribution of mission profiles. When the intended operation and mission profiles of a product oversteps the bounds of our regulatory and policy experience base, as in ETOP, changes to the certification basis are needed. The CMP standard accomplishes those changes to ensure that the reliability, durability, and operational aspects are adequate for its intended use. The lack of acceptable reliability in ETOP constitutes an unsafe condition. That same unsafe condition is likely to exist or develop in other products of the same type design, specifically if they were operated in ETOP. In ETOP a higher level of reliability is imperative in order to maintain a comparable level of safety to that of domestic operations with two engine airplanes. It should be noted that reliability, particularly inflight shutdown (IFSD) rate, is not the sole safety concern in ETOP. There are also common failure mode, operational, environmental, and maintenance threats that can be more critical in ETOP than in domestic operations. Those considerations are also assessed and monitored by our directorates. Thus, an AD could be necessary to correct such a threat to ETOP safety that may not be a threat in domestic operation.

Conclusion:

In light of the above, the Transport Airplane and the Engine and Propeller Directorates plan to use the AD process to control the continuing airworthiness type design requirements of the ETOP CMP standard. The use of AD's on ETOP equipment is consistent with FAR 39 and has a precedent. Three ETOP AD's have already been issued; one withdrawing approval of the B737 aircraft powered by CFM56 engines; one requiring modification of JT9D-7R4 engines with a more stringent compliance schedule for ETOP engines; and one requiring periodic in-flight checking of the fuel system cross-feed valve on certain ETOP aircraft.

Whenever possible, rather than mandating a revised CMP document containing a new CMP standard, an ETOP AD would be written against a specific aircraft or engine model requiring a single modification, maintenance, or operational action to correct one specific problem or deficiency that is clearly affecting ETOP safety. However, there may be cases where several problems together may degrade ETOP fleet reliability to an unsafe level or prevent the reliability from achieving the ETOP objective of 0.02 IFSD per 1,000 engine hours. In those cases, the AD may require several aircraft/engine modifications, inspections, or restrictions by either 1.) incorporating the requirements directly into the AD or 2.) mandating a later revision of the document(s) containing a revised CMP standard.

This position does not preclude the continued use of OPS SPECS by Flight Standards to levy CMP standards on domestic operators. The AD and OPS SPECS processes would operate in parallel. In instances where the need for corrective action is more urgent, the AD would likely precede a revision to the document containing the CMP standard and its implementation via OPS SPECS. In such a case, Flight Standards would still be involved in the process through their AEG member who is a part of every AD Board. There will always be an AD written to correct any safety related deficiency in the CMP standard. Since the AD takes precedence, it will not always be necessary to implement a corresponding change via the OPS SPECS. However, the OPS SPECS is a valuable means to track, surveil, and enforce the CMP standard domestically and we recommend that it be retained for that purpose.

Our directorates will apply the usual AD processing procedures for preparing, coordinating, and issuing AD's. The type of AD required will be consistent with prevailing policy (i.e., telegraphic, immediate adopted, or NPRM). An AD which affects only the engine or the airframe, will be prepared and issued by the responsible directorate. An AD which affects both engines and airframe would be fully coordinated between both directorates and reflect both in the "FOR INFORMATION CONTACT" section. However, since the suitability approval is against the airplane, such AD's would be prepared and issued by the Transport Airplane Directorate.

We trust this clarifies our understanding of the issue. Your concurrence with our position on regulation of the CMP standard via the AD process would be appreciated.

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