

DEPARTMENT OF TRANSPORTATION**Federal Aviation Administration****14 CFR Part 39**

[Docket No. FAA-2008-0032; Directorate Identifier 2007-NM-314-AD; Amendment 39-15538; AD 2008-11-15]

RIN 2120-AA64

Airworthiness Directives; McDonnell Douglas Model 717-200 Airplanes; Model DC-9-10 Series Airplanes; Model DC-9-20 Series Airplanes; Model DC-9-30 Series Airplanes; Model DC-9-40 Series Airplanes; Model DC-9-50 Series Airplanes; Model DC-9-81 (MD-81), DC-9-82 (MD-82), DC-9-83 (MD-83), and DC-9-87 (MD-87) Airplanes; Model MD-88 Airplanes; and Model MD-90-30 Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for all McDonnell Douglas airplanes identified above. This AD requires revising the FAA-approved maintenance program, or the Airworthiness Limitations (AWLs) section of the Instructions for Continued Airworthiness, as applicable, to incorporate new AWLs for fuel tank systems to satisfy Special Federal Aviation Regulation No. 88 requirements. This AD results from a design review of the fuel tank systems. We are issuing this AD to prevent the potential for ignition sources inside fuel tanks caused by latent failures, alterations, repairs, or maintenance actions, which, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane.

DATES: This AD is effective July 3, 2008.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of July 3, 2008.

ADDRESSES: For service information identified in this AD, contact Boeing Commercial Airplanes, Long Beach Division, 3855 Lakewood Boulevard, Long Beach, California 90846, Attention: Data and Service Management, Dept. C1-L5A (D800-0024).

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through

Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (telephone 800-647-5527) is the Document Management Facility, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue, SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Serj Harutunian, Aerospace Engineer, Propulsion Branch, ANM-140L, FAA, Los Angeles Aircraft Certification Office, 3960 Paramount Boulevard, Lakewood, California 90712-4137; telephone (562) 627-5254; fax (562) 627-5210.

SUPPLEMENTARY INFORMATION:**Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an airworthiness directive (AD) that would apply to McDonnell Douglas Model 717-200 airplanes; Model DC-9-10 series airplanes; Model DC-9-20 series airplanes; Model DC-9-30 series airplanes; Model DC-9-40 series airplanes; Model DC-9-50 series airplanes; Model DC-9-81 (MD-81), DC-9-82 (MD-82), DC-9-83 (MD-83), and DC-9-87 (MD-87) airplanes; Model MD-88 airplanes; and Model MD-90-30 airplanes. That NPRM was published in the **Federal Register** on January 18, 2008 (73 FR 3422). That NPRM proposed to require revising the FAA-approved maintenance program, or the Airworthiness Limitations (AWLs) section of the Instructions for Continued Airworthiness (ICA), as applicable, to incorporate new AWLs for fuel tank systems to satisfy Special Federal Aviation Regulation No. 88 requirements.

Changes Made to This AD

For standardization purposes, we have revised this AD in the following ways:

- We have added a new paragraph (i) to this AD to specify that no alternative inspections, inspection intervals, or critical design configuration control limitations (CDCCLs) may be used unless they are part of a later approved revision of the Boeing Twinjet Special Compliance Items Report, MDC-92K9145, Revision G, dated June 7, 2007 (hereafter referred to as "Report MDC-92K9145"), or unless they are approved as an alternative method of compliance (AMOC). Inclusion of this paragraph in the AD is intended to ensure that the AD-mandated airworthiness limitations

changes are treated the same as the airworthiness limitations issued with the original type certificate.

- We have revised Note 1 of this AD to clarify that an operator must request approval for an AMOC if the operator cannot accomplish the required inspections because an airplane has been previously modified, altered, or repaired in the areas addressed by the required inspections.

Comments

We gave the public the opportunity to participate in developing this AD. We considered the comments received from the five commenters.

Request To Revise Note 1

Boeing requests that we revise Note 1 of the NPRM to clarify the intent of the note. Boeing states that Note 1 of the NPRM might be misinterpreted to mean that the AWLs of Report MDC-92K9145 must be revised to reflect modifications, alterations, or repairs that are initiated by an operator and outside of Boeing's design cognizance and responsibility. Boeing requests that we revise Note 1 as follows:

- Replace the words "revision to" with "a deviation from" in the last sentence.
- Delete the words "(g), (h), or" and "as applicable" from the last sentence.

As stated previously, we have clarified the language in Note 1 of this AD for standardization with other similar ADs. The language the commenter requests that we change does not appear in the revised note. Therefore, no additional change to this AD is necessary in this regard.

Request To Clarify Approval of Component Maintenance Manual (CMM) Changes

Boeing requests that we revise the heading and certain wording for the "Changes to Component Maintenance Manuals (CMMs) Cited in Fuel Tank System AWLs" section of the NPRM. Boeing believes that section was intended to address situations where an operator chooses to deviate from the procedures in the CMM referenced in Report MDC-92K9145. Boeing states that its proposed changes are intended to clarify that only deviations proposed by an operator require approval of the Manager, Los Angeles Aircraft Certification Office (ACO), FAA. Boeing further states that wording in the NPRM could be interpreted to mean that approval of a CMM in its entirety, including any future CMM revisions by Boeing, would require direct approval of the Manager, Los Angeles ACO, or governing regulatory authority.

Specifically, Boeing requests that we revise that section as follows:

- Revise the heading to “Deviations from Component Maintenance Manuals (CMMs) Cited in Fuel Tank System AWLs.”
- Revise the third sentence to state that the Manager, Los Angeles ACO, must approve “any deviations from” the CMMs “as defined in Report MDC–92K9145.”
- Replace the words “revision of” with “deviation from” in the fourth sentence.
- Delete the entire last sentence.

We agree that clarification is necessary. Our intent is that any deviation from the CMMs as defined in Report MDC–92K9145 must be approved by the Manager, Los Angeles ACO, or the governing regulatory authority, before those deviations can be used. However, we have not changed the AD as suggested by the commenter, since the “Changes to Component Maintenance Manuals (CMMs) Cited in Fuel Tank System AWLs” section of the NPRM is not retained in this AD.

Request To Identify Additional Service Information

The Air Transport Association (ATA), on behalf of its member Delta Airlines (DAL), requests that we revise the NPRM to identify the affected airplane maintenance manual (AMM), structural repair manual (SRM), and standard wiring practices manual (SWPM) sections for each CDCCL and AWL inspection. DAL states that Appendixes B, C, and D of Report MDC–92K9145 do not fully identify all manuals that require revision to incorporate the requirements of the given appendix, but that the information is available in a cross-reference document that Boeing has made available on the Internet at <https://www.myboeingfleet.com/>.

DAL notes that the “Ensuring Compliance With Fuel Tank System AWLs” section of the NPRM indicates that Boeing has revised the applicable manuals to address AWLs and to include notes about CDCCLs. However, DAL has reviewed the applicable manuals and notes that certain information specified in Report MDC–92K9145 is not present. For example, although MD–90 CDCCL 28–3 specifies to use only connector part number 14158–2 when rebuilding or repairing a pump conduit assembly in accordance with chapter 28–20–7 of the Boeing overhaul manual, this requirement is not included in the SWPM or CMM 28–

20–07, or identified as a CDCCL in the CMM.

We disagree with revising this AD as requested by the commenter. Boeing formatted Report MDC–92K9145 to provide specific information, where appropriate, concerning the limitations and necessary actions to maintain CDCCLs and AWL inspections. This revised service information is readily available to affected operators; therefore, there is no need to be more specific in this AD. No change to this final rule is necessary in this regard.

Request To Allow Continued Use of Existing Inventory Parts

The ATA, on behalf of its member American Airlines, submitted a comment objecting to the language in Report MDC–92K9145 that controls maintenance to the standards specified in the referenced CMMs without deviation according to a FAA-approved service bulletin. American Airlines states that this proposed requirement will mandate the removal of long-standing, proven parts substitutions and repair techniques developed by the operator in accordance with processes and procedures approved by the FAA. American Airlines also states that proposed requirement might also make obsolete certain test instruments and procedures developed by operators. American Airlines asserts that, without federally-regulated parts supply chains with price controls, the proposed process makes it impossible for operators to ensure that they have multiple sources for parts that can be obtained at reasonable prices. American Airlines states that, in order to ensure that CMM-approved parts cannot be interchanged with other approved substitute parts, operators will be forced into expensive redesigns of their inventory systems, or special procedures to permanently segregate parts for those specified CMMs. American Airlines states that the cost of incorporating the proposed requirements of the NPRM will far exceed the estimated cost specified in the NPRM.

We infer the commenters request that we allow operators to continue to use alternative parts inventory and test equipment for repair and overhaul of their fuel system components and interchange these parts, which might be different than the parts identified in the approved CMM. We disagree with this request. While the commenters are correct about the restrictions included in the referenced service information, operators may always take advantage of alternatives by requesting that those alternatives be evaluated and approved

in accordance with the provisions of paragraph (k) of this AD. No change to this AD is necessary in this regard.

Request To Allow Minor Fuel Pump Repairs Without FAA-Approval

The ATA, on behalf of its member Northwest Airlines (NWA), requests we revise the NPRM to specify that fuel pump repairs that are minor do not require FAA approval, and that existing FAA-approved repairs and parts manufacturer approval (PMA) parts do not require re-approval by the FAA. NWA states that CDCCL 28–2 severely limits or eliminates NWA’s ability to use Part 121 authority to customize the particular CMM with NWA-developed repairs that use alternate PMA materials and vendors.

We disagree with revising this AD as suggested by the commenters. The intent of this AD and Special Federal Aviation Regulation No. 88 (“SFAR 88,” Amendment 21–78, and subsequent Amendments 21–82 and 21–83) is to define CDCCLs, and the repair and overhaul of fuel system components in accordance with the limitations specified in Report MDC–92K9145. The impetus to declare overhaul and repair of certain fuel tank system components as CDCCLs arose from in-service pump failures that resulted from repairs not done according to the original equipment manufacturer (OEM) procedures. Therefore, all changes, whether minor or major, must be approved by the Manager, Los Angeles ACO. NWA did not identify any PMAs that would require re-approval. Any existing or future PMAs, or deviations from the approved CMMs, can be requested by the AMOC process.

Request To Revise Estimated Costs

The ATA, on behalf of its members DAL and NWA, disagrees with the “Costs of Compliance” section of the NPRM. DAL estimates that it will take at least 40 hours to document and implement the changes to the ICA, rather than 1 hour as proposed in the NPRM. DAL also notes that the “Costs of Compliance” section of the NPRM does not include the labor time required for accomplishing the required repetitive inspections. NWA states it overhauled and repaired 75 fuel pumps in 2007, and that it estimates that compliance with CDCCL 28–2 will add about \$1,000 to the cost of each overhauled/repared fuel pump.

We infer that the commenters request that we revise the “Costs of Compliance” section of this AD. We agree that, for certain operators, there might be a one-time cost associated with changing over from existing repair/

overhaul procedures to the CMM procedures approved under SFAR 88. However, we disagree with including the costs in this AD for complying with the CDCCLs. The economic analysis of an AD is limited only to the cost of actions actually required by the rule. It does not consider the costs of “on-condition” actions (that is, actions needed to correct an unsafe condition) because, regardless of AD direction, those actions would be required to correct an unsafe condition identified in an airplane and ensure operation of that airplane in an airworthy condition, as required by the Federal Aviation Regulations. No change is necessary in this regard.

We also disagree with increasing the estimated work-hours for incorporating new AWLs for fuel tank systems into the FAA-approved maintenance program, or AWLs section of the ICA, as applicable. While some individual operators may take longer to accomplish the requirements, others may not. Our cost estimate is based on an average of expected costs for all operators. We also disagree with including the cost of accomplishing the repetitive AWL inspections, since they are not directly required by this AD. This AD only requires the change to the maintenance program, or AWLs of the ICA, as applicable. The operating rules require the repetitive inspections once the maintenance program/ICA is changed. No change to this AD is necessary in this regard.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously. We also determined that these changes will not increase the economic burden on any operator or increase the scope of the AD.

Costs of Compliance

We estimate that this AD affects 780 airplanes of U.S. registry. We also estimate that it takes about 1 work-hour per product to comply with this AD. The average labor rate is \$80 per work-hour. Based on these figures, we estimate the cost of this AD to the U.S. operators to be \$62,400, or \$80 per product.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA’s authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. “Subtitle VII: Aviation Programs,” describes in more

detail the scope of the Agency’s authority.

We are issuing this rulemaking under the authority described in “Subtitle VII, Part A, Subpart III, Section 44701: General requirements.” Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Is not a “significant rule” under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979), and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

You can find our regulatory evaluation and the estimated costs of compliance in the AD Docket.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

■ Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39—AIRWORTHINESS DIRECTIVES

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

- 2. The FAA amends § 39.13 by adding the following new AD:

2008–11–15 McDonnell Douglas:
Amendment 39–15538. Docket No. FAA–2008–0032; Directorate Identifier 2007–NM–314–AD.

Effective Date

(a) This airworthiness directive (AD) is effective July 3, 2008.

Affected ADs

(b) None.

Applicability

(c) This AD applies to all McDonnell Douglas Model 717–200 airplanes; Model DC–9–11, DC–9–12, DC–9–13, DC–9–14, DC–9–15, and DC–9–15F airplanes; Model DC–9–21 airplanes; Model DC–9–31, DC–9–32, DC–9–32 (VC–9C), DC–9–32F, DC–9–33F, DC–9–34, DC–9–34F, and DC–9–32F (C–9A, C–9B) airplanes; Model DC–9–41 airplanes; Model DC–9–51 airplanes; Model DC–9–81 (MD–81), DC–9–82 (MD–82), DC–9–83 (MD–83), and DC–9–87 (MD–87) airplanes; Model MD–88 airplanes; and Model MD–90–30 airplanes; certificated in any category.

Note 1: This AD requires revisions to certain operator maintenance documents to include new inspections. Compliance with these limitations is required by 14 CFR 91.403(c). For airplanes that have been previously modified, altered, or repaired in the areas addressed by these inspections, the operator may not be able to accomplish the inspections described in the revisions. In this situation, to comply with 14 CFR 91.403(c), the operator must request approval for an alternative method of compliance (AMOC) according to paragraph (k) of this AD. The request should include a description of changes to the required inspections that will ensure the continued operational safety of the airplane.

Unsafe Condition

(d) This AD results from a design review of the fuel tank systems. We are issuing this AD to prevent the potential for ignition sources inside fuel tanks caused by latent failures, alterations, repairs, or maintenance actions, which, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane.

Compliance

(e) Comply with this AD within the compliance times specified, unless already done.

Service Information Reference

(f) The term “Report MDC–92K9145,” as used in this AD, means the Boeing Twinjet Special Compliance Items Report, MDC–92K9145, Revision G, dated June 7, 2007.

Revise the FAA-Approved Maintenance Program

(g) For Model DC–9–11, DC–9–12, DC–9–13, DC–9–14, DC–9–15, and DC–9–15F airplanes; Model DC–9–21 airplanes; Model DC–9–31, DC–9–32, DC–9–32 (VC–9C), DC–9–32F, DC–9–33F, DC–9–34, DC–9–34F, and DC–9–32F (C–9A, C–9B) airplanes; Model DC–9–41 airplanes; Model DC–9–51 airplanes; and Model DC–9–81 (MD–81), DC–9–82 (MD–82), DC–9–83 (MD–83), and DC–9–87 (MD–87) airplanes: Before December 16, 2008, revise the FAA-approved maintenance program to incorporate the information specified in Appendixes B, C, and D of

Report MDC-92K9145. Accomplishing the revision in accordance with a later revision of Report MDC-92K9145 is an acceptable method of compliance if the revision is approved by the Manager, Los Angeles Aircraft Certification Office (ACO), FAA.

Revise the Airworthiness Limitations (AWLs) Section

(h) For Model 717-200, Model MD-88, and Model MD-90-30 airplanes: Before December 16, 2008, revise the AWLs section of the Instructions for Continued Airworthiness (ICA) to incorporate the information specified in Appendixes B, C, and D of Report MDC-92K9145. Accomplishing the revision in accordance with a later revision of Report MDC-92K9145 is an acceptable method of compliance if the revision is approved by the Manager, Los Angeles ACO.

No Alternative Inspections, Inspection Intervals, or Critical Design Configuration Control Limitations (CDCCLs)

(i) After accomplishing the actions specified in paragraph (g) or (h) of this AD, as applicable, no alternative inspections, inspection intervals, or CDCCLs may be used unless the inspections, intervals, or CDCCLs are part of a later revision of Report MDC-92K9145 that is approved by the Manager, Los Angeles ACO; or unless the inspections, intervals, or CDCCLs are approved as an AMOC in accordance with the procedures specified in paragraph (k) of this AD.

No Reporting Requirement

(j) Although Report MDC-92K9145 specifies to submit certain information to the manufacturer, this AD does not require that action.

Alternative Methods of Compliance (AMOCs)

(k)(1) The Manager, Los Angeles ACO, FAA, ATTN: Serj Harutunian, Aerospace Engineer, Propulsion Branch, ANM-140L, 3960 Paramount Boulevard, Lakewood, California 90712-4137; telephone (562) 627-5254; fax (562) 627-5210; has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19.

(2) To request a different method of compliance or a different compliance time for this AD, follow the procedures in 14 CFR 39.19. Before using any approved AMOC on any airplane to which the AMOC applies, notify your appropriate principal inspector (PI) in the FAA Flight Standards District Office (FSDO), or lacking a PI, your local FSDO.

Material Incorporated by Reference

(l) You must use the Boeing Twinjet Special Compliance Items Report, MDC-92K9145, Revision G, dated June 7, 2007, to do the actions required by this AD, unless the AD specifies otherwise.

(1) The document contains the following errors:

(i) The Index of Page Changes specifies incorrect revision levels for certain pages. The revision levels specified on each page are correct.

(ii) There are three sets of pages (six pages total) with the same page numbers in

Appendix C (i.e., pages C1 and C2). The first set of page numbers (i.e., Appendix C title page and Twinjet Airworthiness Limitation Instructions (ALIs)) is correct. The second set of page numbers (i.e., ALI 20-2) is incorrect. Those pages should be identified as page numbers C6 and C7 as specified in the Index of Page Changes. The third set of page numbers (i.e., ALI 20-3) is also incorrect. Those pages should be identified as page numbers C8 and C9 as specified in the Index of Page Changes.

(iii) None of the pages are dated. The issue date for each revision is specified in the Index of Page Changes.

(2) The Director of the Federal Register approved the incorporation by reference of this service information under 5 U.S.C. 552(a) and 1 CFR part 51.

(3) For service information identified in this AD, contact Boeing Commercial Airplanes, Long Beach Division, 3855 Lakewood Boulevard, Long Beach, California 90846, Attention: Data and Service Management, Dept. C1-L5A (D800-0024).

(4) You may review copies of the service information incorporated by reference at the FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington; or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

Issued in Renton, Washington, on May 15, 2008.

Ali Bahrami,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. E8-11502 Filed 5-28-08; 8:45 am]

BILLING CODE 4910-13-P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2008-0231; Directorate Identifier 2007-NM-218-AD; Amendment 39-15534; AD 2008-11-12]

RIN 2120-AA64

Airworthiness Directives; Fokker Model F.28 Mark 0070 and Mark 0100 Airplanes

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for the products listed above. This AD results from mandatory continuing airworthiness information (MCAI) originated by an aviation authority of another country to identify and correct an unsafe condition on an aviation

product. The MCAI describes the unsafe condition as:

To date, there have been at least 10 reported events on Fokker 70 (F28 Mark 0070) and Fokker 100 (F28 Mark 0100) aircraft where the flight crew manually overpowered the autopilot, inadvertently neglecting to disengage the autopilot. * * * When the autopilot is not disengaged, the elevator servomotor is overpowered and the horizontal stabilizer is moved by the Automatic Flight Control & Augmentation System (AFCAS) auto-trim in a direction opposite to the (manual) deflection of the elevator, causing high elevator control forces. This condition, if not corrected, could cause the stabilizer to move to an extreme out-of-trim position, creating the (remote) possibility of loss of control of the aircraft, due to the extreme control loads.

We are issuing this AD to require actions to correct the unsafe condition on these products.

DATES: This AD becomes effective July 3, 2008.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of July 3, 2008.

ADDRESSES: You may examine the AD docket on the Internet at <http://www.regulations.gov> or in person at the U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue, SE., Washington, DC.

FOR FURTHER INFORMATION CONTACT: Tom Rodriguez, Aerospace Engineer, International Branch, ANM-116, Transport Airplane Directorate, FAA, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 227-1137; fax (425) 227-1149.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an AD that would apply to the specified products. That NPRM was published in the **Federal Register** on March 3, 2008 (73 FR 11366). That NPRM proposed to correct an unsafe condition for the specified products. The MCAI states:

To date, there have been at least 10 reported events on Fokker 70 (F28 Mark 0070) and Fokker 100 (F28 Mark 0100) aircraft where the flight crew manually overpowered the autopilot, inadvertently neglecting to disengage the autopilot. Detailed investigation of these incidents has shown that this usually occurs in a high workload environment that demands immediate manual control of the aircraft by the pilot flying, e.g. terrain warning. When the autopilot is not disengaged, the elevator servomotor is overpowered and the horizontal stabilizer is moved by the