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Maintenance

JOINT OIL ANALYSIS PROGRAM (JOAP)

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements responsibilities and establishes procedures applicable to the Joint Oil Analysis Program (JOAP) and all unit commanders, staff sections, maintenance officers, supervisors, and JOAP monitors at all levels of command that require JOAP laboratory support. It applies to all units who require support from the Andersen Air Force Base JOAP Laboratory. Deployed units shall make every effort to comply with this instruction while assigned to Andersen Air Force Base. This OI implements and expands requirements and procedures in accordance with (IAW) AFD 21-1 *Managing Aerospace Equipment Maintenance*, AFI 21-124 *Air Force Oil Analysis Program*, PACAFI 21-101 *Maintenance Management of Aircraft*, and TO 33-1-37-1/2/3 (NAVAIR 17-15-50.1/2/3) *Joint Oil Analysis Program Manual*. This publication does not apply to the Air National Guard (ANG) or US Air Force Reserve and their units.

SUMMARY OF REVISIONS

A (|) indicates revision from the previous edition.

1. JOAP Meetings:

- 1.1. The quarterly JOAP meetings have been waived by HQ PACAF and will not be held.
- 1.2. All JOAP results will be forwarded to the owning organizations.

2. Training Requirements:

- 2.1. Each unit or activity will ensure all personnel in the JOAP program are trained on goals, regulations and local procedures surrounding the program. Each training record will reflect compliance.
- 2.2. Owning organization supervisors will indoctrinate all personnel on proper sampling procedures for their respective propulsion unit IAW T.O. 33-1-37 before authorizing them to take samples.

2.3. All JOAP monitors will visit the JOAP Lab within 30 days of being assigned as part of the indoctrination into the program. They will learn about the basic workings of JOAP, their responsibilities and correct procedures.

2.4. JOAP Lab personnel will train all primary and alternate JOAP monitors using the locally developed and approved training guide.

2.5. JOAP Lab personnel are required to complete an approved Oil Analysis Operator/Evaluator Course and have at least 6 months continuous experience working in the JOAP facility as an evaluator before being certified to burn JOAP samples.

2.6. Aircrews will be trained by their respective JOAP monitors on the regulations and local procedures regarding the JOAP and will ensure compliance while in transit.

3. Applicability:

3.1. Employment of the oil analysis process is limited to aircraft/helicopter jet or reciprocating engines/transmissions and oil servicing carts that are in use. A request with sufficient justification for applying the analysis process to other oil wetted systems or equipment exhibiting a potential for tangible savings or an increase in the item life cycle will be forwarded to the JOAP Laboratory NCOIC for review and subsequent action.

4. Procedures for JOAP Equipment Breakdowns or Work Stoppage:

4.1. Whenever maintenance requirements for the Spectroil M spectrometer are beyond the scope of intermediate level capability, the Precision Measurement Equipment Laboratory will request Spectro Inc. assistance IAW T.O. 33B4-2-29-1.

4.2. In the event that JOAP analysis capability cannot be sustained, notification will be made to HQ PACAF/LGM in order to borrow a mobile unit from another PACAF base.

4.3. The NDI/JOAP NCOIC will notify the Fabrication Flight Chief and Supervision prior to reporting the Spectroil M as "Reported Maintenance" to the JOAP Technical Support Center at Pensacola Naval Air Station.

5. Maintenance Procedures:

5.1. Commanders of organizations that may require oil analysis for aircraft/helicopters, Helicopter Support Squadron (HC-5), 734th Air Mobility Squadron (AMS), as well as Transient Alert, will appoint primary and alternate JOAP monitors in writing. Forward appointment letters to the JOAP Laboratory. This list will be updated yearly or earlier if changes occur. The primary JOAP monitor will be in a position of authority to oversee and take corrective action on JOAP related problems. Alternate JOAP monitors will be assigned as needed to ensure proper coverage on all shifts.

5.2. The above listed NDI/JOAP customers will ensure the following:

5.2.1. Samples are taken in accordance with this instruction and applicable technical data.

5.2.2. Individuals will document data correctly and legibly on DD Form 2026, *Oil Analysis Request*. The individual filling out the DD Form 2026 will clearly print name and employee number and sign in the appropriate block. A signed DD Form 2026 is a source document and the individual will be held responsible for all information contained on the form.

5.2.3. Engine overhaul hours will be tracked using engine flight hours for Air Force and hours since last overhaul for Navy customers.

5.2.4. Provide the NDI/JOAP Laboratory with 14 day records checks for aircraft records to ensure correct engine serial numbers, engine/transmission hours, hours since last oil change, and total oil serviced since last JOAP sample are shown on the DD Form 2027, *Oil Analysis Record*, or automated equivalent. For HC-5 samples, this requirement may be satisfied by a phone call or an e-mail from HC-5 QA Section to the NDI/JOAP Laboratory personnel. Owing organization should establish local procedures.

5.2.5. Customers will ensure a method to accurately track "Total Oil Added Since Last Sample" is developed. This data will be carried over to the DD Form 2026 with every JOAP sample submitted. Failure to accurately track oil consumption will severely impact the ability of oil analysis to detect impending failures.

5.3. Clear lines of communication will be established between the NDI/JOAP Lab, its customers and other sections/units responsible for JOAP administration to include:

5.3.1. HC-5 QA will maintain a sample log IAW NAVAIR 17-15-50.2 and will track all samples submitted to the JOAP Lab.

5.3.2. The JOAP Lab will maintain a JOAP sample sign-in log to ensure positive communication between the JOAP Lab and it's customers. Customers will identify a "Red Cap" or special sample by drawing a red border around the outside of the sample package and on the DD Form 2026. The form will contain as a minimum the following information: date, sample number, type of aircraft, aircraft serial number, position number, time sample taken, time sample was received, time customer was notified with results and a remarks section.

5.4. The JOAP Lab will:

5.4.1. Ensure oil analysis data is accurately coded and submitted to OC-ALC, Tinker AFB, OK via DMS or equivalent, according to T.O. 33-1-37-2.

5.4.2. Immediately notify the owning organization's JOAP monitor when an engine/transmission is restricted from operation or is placed on special sampling to allow customer time to coordinate an appropriate course of action.

5.4.3. Immediately notify Transient Alert personnel of any suspected "burnt (black) oil" samples and instruct them to Red X the engine, cease operations, and submit a resample immediately. Upon burnt oil confirmations, owning organization's home station will be available for pick-up within 24 hours of notification.

5.4.4. Print the automated DD Form 2027, *Oil Analysis Record*, for Navy assets as requested by the customer. These records will be available for pick-up within 24 hours of notification.

5.4.5. Ensure samples with documentation errors are analyzed and placed on local code "D".

5.4.6. Aircraft placed on "Code D" with normal readings will be returned to their applicable code when the DD Form 2026 is corrected by the customer.

5.4.7. Ensure a copy of the documentation discrepancy report is distributed to all JOAP monitors on the first Friday of the month.

5.5. Communications regarding abnormal JOAP sample results will be documented in logs maintained by the JOAP Lab. The log will include what instructions were passed and received and by whom, date, time, aircraft serial number and component serial number.

6. Sampling Intervals and Procedures Exceptions:

6.1. All aircraft components under special surveillance or "Red Cap" status will be sampled immediately and the samples will be delivered to the JOAP Lab within 1 hour after request or engine shut-down. The JOAP Lab will notify the owning organization within 30 minutes of receipt of the sample. No aircraft on surveillance will be released for flight until the sample results are known. Aircraft under special surveillance or "Red Cap" status will not be scheduled for multiple flights that will not allow sufficient time for sample analysis.

6.2. All operational efforts will be made to keep the routine sample response time to 2.5 hours for combat coded aircraft and 4 hours for non-combat coded aircraft. Samples will be taken hot. For combat coded aircraft, personnel will have 1.25 hours to take the samples and to deliver to the JOAP Lab. The JOAP Lab will in turn have 1.25 hours to report the results of the analysis to the customer. For non-combat coded aircraft, samples have to be taken and brought to the JOAP Lab within 2.5 hours. The JOAP Lab will in turn have 1.5 hours to burn the samples and report the results of the analysis to the customer.

6.3. HC-5 personnel will have 30 minutes to take the sample after engine shut down and 11 hours to deliver the sample to the JOAP Lab. This is due to Navy regulations that require Quality Assurance to review and log samples before they leave HC-5. The JOAP Lab will have 1.5 hours to report the results to HC-5 QA.

6.3.1. Engines that are suspect or on surveillance (Code E or C), will not be allowed to fly cross-country without prior approval from the owning organization's OG/CC. For transient aircraft, JOAP Lab personnel will contact home station JOAP Lab to coordinate waiver approval.

NOTE: NDI personnel (AFSC 2A7X2) are the only personnel allowed to implement, remove, or change JOAP code recommendations. If a unit wishes to override a recommendation, it must be done in writing and must include justification.

6.4. All new, overhauled or jet intermediate maintenance engines will be sampled after the initial functional check flight IAW T.O 33-1-37-1.

6.5. Installed engines. When an engine requires maintenance of external oil wetted component(s), when the engine is changed, or the tank is serviced with more than one-half of its capacity, the customer must submit 3 samples for trend analysis. This will consist of an initial sample and 2 more special samples with a minimum of 5 hours on the engine oil between each sample submitted.

7. Special Sampling Procedures:

7.1. Transient aircraft with abnormal trend engines:

7.1.1. If a sample for a transient aircraft results in abnormal readings, the NDI Lab will contact the owning organization NDI/JOAP Lab to coordinate the appropriate course of action to be taken. NDI will notify T/A with the appropriate code and course of action.

7.1.2. In the event the owning organization's NDI personnel can not be reached, Andersen NDI personnel will notify T/A and maintenance supervision with the Lab's recommendations to be forwarded to the aircraft commander.

7.2. HC-5 helicopters:

7.2.1. In the event a helicopter component is identified with abnormal readings, the JOAP Lab personnel will recommend the appropriate sample code IAW trend guidelines in T.O 33-1-37-3 and notify HC-5 QA to reach an appropriate course of action.

7.2.2. New or overhauled engines will be placed on "Code C" for a minimum of 2 flights after the initial baseline, for a total of 3 samples, to develop a proper trend after installation. Each sample must have a minimum of 5 flying hours before it can be processed (2 samples=10 hours).

7.2.3. When an engine/component change occurs, a component change worksheet must be filled out and forwarded to the JOAP Lab prior to the first sample being taken.

7.2.4. A special sample must be taken at the completion of a test cell run. If a unit is operated on oil that was previously used in the test cell system, an oil sample is required both prior to and at the completion of the test.

7.2.5. All special samples must have a red border around the DD Form 2026 and must have the reason for sample in the remarks section. "Baseline" or "Red Cap" is not a reason for sample.

8. Travel/Deployment to Areas With Certified JOAP Capability:

8.1. All JOAP sampling intervals will be IAW applicable aircraft and JOAP technical data.

8.2. When an aircraft is scheduled for deployment, the customer is responsible for obtaining the JOAP data and ensuring the data accompanies the aircraft along with any other aircraft records prior to departing home station. The customer is also responsible for finding the nearest certified JOAP facility, coordinating the analysis of all samples that come due during the deployment and ensuring all applicable JOAP data is returned to the Andersen AFB JOAP Lab.

8.2.1. Units will request historical data through the JOAP Lab NLT 48 hours prior to launch.

NOTE: If an aircraft is departing from Andersen AFB on a weekend, the cross-country paperwork will be picked up NLT COB on the last duty day prior to the scheduled departure.

9. Travel/Deployments to Areas Without Certified JOAP Capability:

9.1. All JOAP sample intervals will be IAW applicable aircraft and JOAP related technical data.

9.2. All provisions for deployments stated in paragraph eight in regards to JOAP historical data apply.

9.3. Units will forward samples to the nearest certified JOAP Lab with a copy of the historical data and instructions to the laboratory to ensure the results are returned via the most expedient manner.

9.3.1. If Andersen AFB is the nearest certified JOAP Lab, a copy of the historical data will accompany the samples to comply with continuity and the intent of the JOAP Program.

10. Drain & Flush Procedures:

10.1. The JOAP monitors will be the sole points of contact on all JOAP transactions.

10.2. JOAP monitors will ensure drain and flush action on components is not performed as a corrective action to eliminate abnormal or high wear metal trends.

10.3. All drain and flush actions for contamination, or as directed by technical data will be coordinated with the JOAP lab NCOIC and HC-5 Quality Assurance.

10.4. All engines that have had a drain and flush will be placed on "Code C". The engines will then require a minimum of 2 samples after initial baseline sampling in order to ensure an effective analysis trend. Each sample must have a minimum increase of 5 hours/miles since overhaul time documented on the accompanying DD Form 2026. This minimum 5-hour increase also applies to the hours/miles since oil change.

11. JOAP Sample Drop off Procedures:

11.1. Customers delivering samples to the Lab during normal duty hours will ensure every operational effort is made to deliver samples within the specified sample response times.

11.2. Customers delivering samples to the Lab during non-duty hours will place samples in the Sample Drop can/box and annotate the date and time samples were delivered on one of the sample envelopes. Upon delivery, notify the stand-by personnel through the beeper.

11.3. To ensure expedient results for "RED CAP" samples (i.e. Code E or C) annotate "RED CAP" in bold red letters on the outside of the envelope.

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Attachment 1

LAB RECOMMENDATION CODES (FOR REFERENCE ONLY)

General Lab Recommendations:

Code A – Sample results normal, continue routine sampling.

Lab Requested Samples:

Code B – Resample ASAP, do not change oil.

Code C – Resample after 10 hours; do not change oil.

Code E – Do not change oil. Restrict operations to local flights or reduced payload operations, maintain close surveillance and submit check sample after each flight or 10 operating hours until further notice.

Code F – Do not change oil. Submit resample after ground test run. Do not operate until after receipt of Lab result.

Code P – Do not fly or operate; do not change oil, submit resample ASAP.

Oil Change Recommendations:

Code J – Contamination confirmed, change oil, sample after 30 minute run time, and 10 operating hours thereafter.

Inspection Requirements:

Code R – Do not fly or operate; inspect filters, screens, chip detectors and sumps; advise JOAP lab of results.

Code T – Do not fly or operate. Examine for discrepancy and advise JOAP Lab of results and disposition. If a discrepancy is found and corrected, continue operation and submit resample after 10 hours of operation. If discrepancy is not found, recommend removal of component from service and send to maintenance.

Locally Established Code:

Code D – Documentation errors on DD Form 2026. Requires correction to place component on normal sampling code.