

Screening Information Request – SIR: The FAA is looking for candidate unleaded avgas formulations for testing to identify the most viable replacements for the existing 100LL avgas with the least impact on the existing fleet of piston aircraft and fuel availability.

Questions relating:

1. The solicitation advises that its goal is *“to solicit candidate unleaded avgas formulations for testing to identify the most viable replacements for the existing 100LL avgas with the least impact on the existing fleet of piston aircraft and fuel availability”*. Given the limited resources and urgency being expressed on the need to identify a replacement. **How many fuels do you consider the FAA has the capability to identify and if more than one is it proposed that the solicitation address the significant concerns of comingling** of the new likely types of formulae that will be our post-avgas fuels?

The SIR does not specify any number of fuels. For planning and budget purposes, the program was built around, but is not limited to, ten fuels for the Phase 1 evaluation and two fuels for the Phase 2 evaluation. There is flexibility in the plan that would allow for quantity adjustments in both Phases 1 and 2. We are seeking the most viable fuels and the intent is to evaluate all potentially viable fuels that are determined to have the least impact on the fleet. Comingling evaluation is planned as part of the Phase 1 program. Such Phase 1 testing will be the evaluation of mixes of an offeror’s fuel and 100LL. In that comingling could impact the post-program adoption of fuels exiting Phase 2, it is anticipated that a more rigorous evaluation of the comingling will be undertaken on the smaller quantity of Phase 2 fuels.

2. We know our industry is keen to achieve replacement for Avgas as soon as possible. **The SIR appears to be able to allow fuels to progress into phase 2 earlier than 2016 (at least by 1st April 2015)** given they are able to demonstrate a more mature state of readiness and to have its performance verified. Can you confirm this is the case and will the SIR be modified formally to reflect this important detail?

The SIR does indeed allow us to request fuels for entry into Phase 2 as early as April 2015. Therefore the SIR does not need to be modified to reflect this. If fuels accepted into Phase 1 have an extensive data package that is evaluated and deemed to meet Phase I data requirement, it is the intent of the FAA to consider utilizing such test data. If it turns out that offeror-provided data does allow PAFI to accelerate the test program, the SIR has the flexibility to accommodate that. It is worth noting, however, that the current PAFI test program schedule is quite aggressive. Flexibility to accelerate the program was built into the SIR, but the makeup of the fuels submitted will have a large impact on the Phase 1 and Phase 2 test program, and will strongly influence our path forward, and therefore our ability to alter the currently anticipated test schedule.

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3. More recent available information on fuel development programs suggest that at least one fuel has a state of readiness significantly in advance of that apparently assumed by the SIR. **In what ways will the SIR be modified to reflect current states of readiness?**

The ultimate objective of the SIR is to provide technical data to support both ASTM specification development and FAA fleetwide certification. Therefore, even a fuel with an existing ASTM specification will still need to be tested to generate the data necessary to support the FAA fleetwide certification approval. As noted above, the SIR already allows the FAA significant flexibility in when the various Phases will take place. It is the intent of the program to perform some minimum set of tests in both Phases 1 and 2 to provide validation of offeror data and to ensure standardized comparable data in critical areas. Currently we do not see a need to modify the SIR. However, if programmatic changes beyond those currently afforded by the SIR are indicated, we will incorporate needed changes and post such changes in a revised SIR on the FAA contracting website.

4. Joint working

- a. We now know that a significant degree of testing has already occurred for high octane fuels, including that in support of ASTM specification applications as well as confirmation that product development programs have in fact existed for more than 5 years. The centralized certification process might benefit from some of this experience, potentially reducing duplication of work (e.g. test protocols) and improve problem solving as we go forward. **How might this learning be integrated into the FAA expert central program?**

It is the FAA's intent to fully utilize industry's wealth of experience in fuel development and evaluation. Collaboration is crucial to program success, not solely to reduce potential duplication of testing, but also to identify testing /certification issues that were previously unknown. The FAA can benefit from industry experience when trying to adapt test methods developed for leaded fuels to unleaded fuels. The FAA has established the TAC and participates in consensus standards groups to create the conduit for this experience. It is the FAA's intent to invite all Phase 1 and 2 offerors to participate in the TAC. It is the responsibility of the offeror to include all data relevant to the evaluation of their fuel in their submitted data package.

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- b. The UAT ARC recommends development of **specialized test procedures** to support the centralized testing to be done under this SIR. I quote “The specialized test procedures will be used by the FAA Technical Center to generate fuel property data and engine/aircraft performance data necessary to support ASTM specification development and certification approval of existing engines and aircraft that can operate transparently using a new unleaded aviation gasoline.” We understand that some of the existing product test will need to be modified or redefined for determining suitability of UL Avgas candidates. **How do you anticipate this will be done, who will be expected to lead this work, what are some of the milestones for this development of procedures?**

Presently the FAA Tech Center is developing the Phase 1 and Phase 2 test procedures based on the existing ASTM Fuel Test Procedures and FAA certification test requirements for applicability to unleaded fuels. FAA will utilize the TAC for subject matter expertise as needed for input, development and review of any specialized test procedures that may be necessitated by the properties and/or chemical makeup of the candidate fuels. These specialized test procedures will be for conduct of Phase 1 and Phase 2 testing by the FAA Technical Center, or under contract through them. These tests are to satisfy ASTM specification and FAA certification requirements.

- c. The complexity of the technical challenge suggests it would be good to have collaboration to take advantage. Can you confirm **what level of collaboration can we expect and at stages in the SIR process?**

We absolutely agree that close collaboration is important to program success. Once a fuel is entered into the Phase 1 program, agreements will be entered into with each offeror that will allow for communication and data sharing to ensure appropriate and complete evaluation of the fuel. We will look to draft agreements that will maximize the collaboration opportunities while maintaining appropriate competitive contract restrictions.

5. I imagine a challenge of the SIR will be to make steady, speedy progress to selection of suitable candidate fuels. This progress might be much delayed if applicants use this SIR for development of their fuels. **Can you comment on how you will manage this issue to allow the industry to keep moving forward?**

It is a tenet of the program that fuel development is completed prior to the program, and that Phases 1 and 2 are to evaluate the fuels and develop specification and certification data on defined fuels. There is a pre-screening phase that requires either an issued ASTM Test Specification, or data meeting Appendix 1 of the SIR. These requirements are intended to ensure a well-defined fuel.

6. I note the ARC states - a selection process will need to be established in order for FAA to select a limited number of the most promising fuels for testing. **What will be the criteria used for selection of fuels as they move from phase 1 to phase 2. in the SIR phases?**

The entrance criteria for Phase 1 and 2 are published in the SIR. Phase 1 data will be evaluated to select candidate Phase 2 fuels based on the selection criteria published in the SIR. The TEC will again develop an evaluation plan for Phase 2 and utilize this plan to select the fuels with the least impact on the current piston engine fleet. Note that the offeror may update their preliminary feasibility assessment prior to Phase 2 evaluation, based on the Phase 1 data.

Criteria

Factor 1: Fuel Properties and Performance

Fuel Performance, Aircraft Engine Performance, Rig/Component Testing, Materials Compatibility

Factor 2: Fuel Deployment Feasibility

Impact on Existing Aircraft Fleet, Environmental Impact of the Candidate Fuel, Fuel Definition and Control, Producibility and Cost of Candidate Fuel, Impact on Existing Avgas Distribution Infrastructure

7. The UAT ARC recommends the establishment of a solicitation and selection process for candidate unleaded aviation gasolines for the centralized fuel testing program. This process should include a **FAA review board** with the technical expertise necessary to evaluate the feasibility of the candidate fuel. **Can you say more about the FAA review board, is it in existence?**

The FAA TEC (which is equivalent to the UAT ARC's recommended Review Board) has been created. The evaluation plan will be finalized before the TEC sits down to review the data packages submitted by offerors in response to the SIR. The TEC members have all been evaluated and cleared for Conflicts of Interest, and have signed non-Disclosure forms. The TEC members have been selected to ensure the committee has the necessary technical and business expertise to evaluate the candidate fuels. The TEC is comprised of FAA Employees and subject matter experts hired as FAA Contractors.

8. **Fleet Wide Certification/Approval:** The UAT ARC recommends the FAA develop specialized policy and procedures to facilitate the most efficient approach possible for fleet-wide approval of aircraft and engines to use a new aviation gasoline and calls for a replacement fuel for leaded aviation gasoline being available by 2018. Others have said that the approval process should be achievable in 3-4 years from now.
- What is FAA view of when fleet-wide certification is possible?
 - What will be process and key milestones for achieving fleet wide certification?
 - When can you confirm that this approval will be completed by the FAA?

The FAA considers the development of a fleet-wide certification plan to be a critical element of the PAFI process. The extent of the fleet that will be covered by “fleetwide certification” will be dependent upon the fuel properties, composition, and fleet impact, as determined by the Phase 1 and Phase 2 test programs. We recognize that each fuel exiting Phase 2 may require a unique fleetwide approval plan. The level of similarity or deviation of the unleaded fuels to 100LL will drive both the impact on the fleet and the available fleetwide certification options. We will be better able to identify and develop available options when we know the properties and compositions of the fuels that are accepted into Phase 1. We will provide a fleetwide certification data package and process for each fuel as an output of the Phase 2 test program – currently scheduled to complete not later than 2018.

9. The complexity of the technical challenge for Fleet Wide Certification appears to recommend the PAFI program have access to a wide range of experts. We note that some UAT ARC member organization have been excluded from the TAC while arguably almost every sitting member has a vested interest in the decisions taken. **Will TAC participation be reviewed in near future for increased inclusiveness?**

The TAC consists of a diverse group of industry members chosen by the FAA including OEM product manufacturers and other key stakeholders who can be called upon to provide “in-kind” support in the form of Subject Matter Experts (SME’s) as need to support specific PAFI tasks. In addition, TAC members may be requested to furnish “in-kind” support in the form of materials, equipment or services. Due to the competitive nature of the SIR solicitation as governed by FAA contractual and legal guidelines, inclusion on the TAC of a representative from a respondent to the SIR poses a potential conflict of interest relative to those respondents not represented on the TAC, or could create the appearance of a conflict of interest. It is our intent to invite all participants in Phase 1 and 2 to participate in the TAC. As indicated on the FAA Website, the current TAC membership represents an initial listing and is subject to change as the program progresses. Availability of the TAC is crucial to the ultimate success of the program. PAFI management will continue to monitor the TAC for necessary adjustments as may be required to meet program needs. **NOTE: The FAA takes the conflict of interest principle very seriously and the process will be carefully monitored by the Contracting Officer and the FAA’s legal office. Any questions presented by the evaluation team for TAC consideration will go through the Contracting Officer, to ensure responses to same will not prejudice/unfairly benefit any offeror.**

10. How is this work be linked to certification work in the rest of the world. Our customers speak to dual certified aircraft and foreign certified aircrafts. Will there be sharing with other agencies; e.g. EASA?

FAA certification activity is widely recognized around the world and therefore likely to result in broad international acceptance. In addition, we are coordinating with other authorities to

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collaborate on the completion of the test program. The FAA and foreign authorities have a number of pathways to coordinate fleetwide approval plans with the international community to encourage the broadest acceptance of fuel approvals.

11. If proposal is submitted under original group of entries, , but is deemed to be not acceptable -- will there be an explanation of the reasons (and criteria) for rejection and an opportunity to revise the specification?

Yes, an explanation for non-acceptance will be provided. The SIR does allow for the FAA to request "a revised fuel data package with certain changes made or conditions met," as an alternative to acceptance or rejection, if it appears details are lacking in the data package.

12. What if during the review process, something comes to light that causes someone to decide the original evaluation criteria were inappropriate. How does that new information get used to re-evaluate the original entries ?

FAA SIRs are structured to accommodate a one-time review process. The screening criteria in the SIR were developed carefully to assess the impact of the candidate fuels on the fleet, and were based on the efforts of the UAT ARC. Also, the FAA has established a well-qualified team of experts, including both industry and FAA representatives, to develop the evaluation plan and to select the fuels for the program. In addition, the FAA also communicated the screening criteria in the SIR to further ensure a transparent, robust and accurate evaluation process. It is not anticipated that there will be a need to re-evaluate.

13. There is likely to be some sensitive intellectual property. How is that going to be handled? It can sometimes take years for a patent to issue. And the holder of the IP may want to revise the scope of the patent work late in the process -- and any earlier public disclosures would possibly prevent that follow on intellectual property protection.

The members of the Technical Evaluation Committee (TEC) that evaluate the proposals have been vetted for Conflict of Interest and will have signed Non-Disclosure Agreements. Per the FAA Employee Code of Conduct, FAA employees (i.e. the employees in AIR-20 and at the FAA Tech Center) must safeguard proprietary information. Offerors should clearly mark their data as appropriate, and FAA procedures require checking with the owner of the data before the release of any information. As candidate fuels are accepted for entry into the various phases of the test program, agreements will be signed which will address the safeguarding of proprietary information, and will include provisions regarding when data can be made public. All the provisions of the agreements for Phase 1 and Phase 2 will be understood before any offeror commits to participate.

14. Will there be any bias on the acceptance criteria with respect to the existence (or non-existence) of intellectual property? For example, multiple ASTM participants have publicly declared that they do not want any specification approved that involves intellectual property.

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The pre-screening criteria are objective and will evaluate all proposals in the same manner. The existence of IP does not preclude success for fuels entered into this program. There will be no bias in the selection process based on the existence of IP. How IP affects the fuel producibility, distribution and cost will be evaluated, and these effects will be factored into the impact on the fleet. Reference Part L section 5.d.3.f of the SIR.

15. Impact on the fleet - - how will cost verses % of fleet that can use (cannot use) the fuel be weighed such as deviation from historic deviation properties?

The SIR includes a requirement for submittal of a Business Plan, which should address the issues of cost and % of fleet that can use the fuel. Cost and fleet applicability are just two of the criteria that will be used in the assessment of fleet impact. The TEC has been established and is in the process of finalizing the Evaluation Plan for candidate fuels for entry into Phase 1. The Evaluation Plan will have grading criteria for each of the individual core elements contained in the SIR and each of these individual grades will be combined for an aggregate grade of each submitted fuel. The reviewers will make use of the offeror's Business Plans and other data submitted in the data package when grading the proposals for fleet impact.

16. Impact on non- USA use and operations ?

The SIR will only evaluate impact on the United States fleet of aircraft.

17. How will low levels of toxicity be evaluated? Compared to TEL ? Or otherwise?

We are going to compare candidate fuels relative to 100LL and other conventional transportation fuels. The goal is to remove lead due to environmental concerns. Any new fuel formulation should not present toxicological or environmental risks. Environmental impact is an evaluation element in the Phase 1 selection process and it is not anticipated that the evaluation will be limited solely to comparisons to TEL toxicity.

18. Will any toxicity level that is less severe than TEL be deemed acceptable ?

Fuels can present other hazards besides lead emissions. We will strive to make the best, informed decision that we can with regard to potential safety, environmental, and toxicology risk associated with the fuel. The details of the evaluation criteria for environmental impact are currently being developed. As background, in the 1990's MTBE was introduced into automotive fuels as an oxygenate. It was then found to contaminate ground water, and it was banned by many states. We don't want the piston engine aircraft industry to be challenged with changing future aircraft fuel formulations due to environmental or toxicology concerns, such as those posed by MTBE or the current addition of TEL.

19. Supply chain issues: Will a fuel that depends on a single source supply for all or for components be acceptable?

The offeror is required to submit a business plan in the pre-screening data that addresses both cost and production implementation of the proposed fuel. The evaluation plan will consider all

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aspects that might affect cost or availability of the fuel based on the information submitted from the offeror in the business plan.