AVIATION WEEK
PROGRAM EXCELLENCE AWARDS

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Thank you for participating,

Gregory Hamilton
President
Aviation Week Network

Acknowledged, agreed, and submitted by

Ray Boyd

Nominee's Signature

6/30/2025

Date

Nominee's Name (please print): Ray Boyd

Title (please print): General Manager, M&PM Mechanical Subsystems

Company (please print): Honeywell International Inc.

NOMINATION FORM

Name of Program: 131-9A Load Compressor Seal Leaks

Name of Program Leader: Savita Nair

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☒ Customer Approved

- Date: 03/07/2025 _____
- Customer Contact (name/title/organization/phone): Bruno PREVITALI / AIRBUS / Customer Services A320 family Program / +33 6 31 98 36 01 _____

☐ Supplier Approved (if named in this nomination form)

- Date: _____
- Supplier Contact (name/title/organization/phone): _____

PLEASE REFER TO PROGRAM EXCELLENCE DIRECTIONS AS YOU COMPLETE THIS FORM.

SECTION 1: EXECUTIVE SUMMARY

Make the Case for Excellence

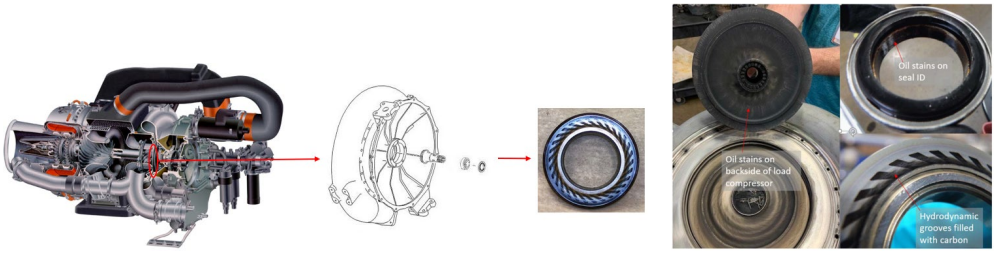
Value: 10 points

Use 12 pt. Times Roman typeface.

What is the vision for this program/project? What unique characteristics and properties qualify this program for consideration?

Auxiliary Power Units (APUs) are essential for aircraft readiness and passenger comfort. The Honeywell 131-9A is a trusted APU, known for reliability in routine and extraordinary circumstances.
It played a key role during the Hudson River landing of Flight 1549. Its reputation is built on engineering excellence and innovation.

However, even the most successful products face challenges. In 2018, Honeywell received in-service issues related to Load Compressor seal causing oil leaks. This problem risked impacting customer satisfaction. What followed was a remarkable journey of technical problem-solving, customer collaboration, and rapid innovation.



Oil Leaks past the Load compressor Seal in 131-9A APUs

Vision: Engineering Excellence with Customer-Centric Innovation

When the LC seal issue emerged, the vision of delivering uncompromising reliability, safety, and performance expanded to include a rapid, first-time-right solution that would restore customer trust and eliminate the root cause of the problem. Key elements of this vision included: Speed with Precision, Customer Partnership & Supplier Coordination.

Unique Characteristics of the Program

1. Proven Legacy and Critical Role in Aviation: Since its introduction in 1995, over 15,000 units have been shipped, making it one of the most widely used APUs in the world. Its performance during the "Miracle on the Hudson" further cemented its legacy.
2. Addressing a High-Impact Issue with Strategic Urgency, First-Time-Right Execution and Rapid Deployment: Honeywell responded to the LC seal related field removals with speed and precision through the selection of the best seal supplier, accelerated validation testing, and close coordination with aircraft manufacturer Airbus.
3. Sophisticated Root Cause Analysis and Engineering Rigor: The team conducted a comprehensive root cause analysis, including failure mode analysis, material analysis, and simulation modeling, leading to a complete re-engineering of the seal system.
4. Deep Customer Collaboration and Transparent Communication: Honeywell involved aircraft manufacturer Airbus & key airline customers from beginning to end and made them part of the solution journey building trust in the solution and enabling faster approvals.

DIRECTIONS

- **Do not exceed 10 pages in responding to the following four descriptions**.
  - Allocate these 10 pages as you deem appropriate, but it is important that you respond to all four sections.
- DO NOT REMOVE THE GUIDANCE PROVIDED FOR EACH SECTION.
- Use 12 pt. Times Roman typeface throughout.
- Include graphics and photos if appropriate; do not change margins.

SECTION 2: VALUE CREATION

Value: 15 points

Please respond to the following prompt:

- **Clearly define the value of this program/project for the corporation; quantify appropriately**

The Load Compressor (LC) seal redesign program has delivered measurable financial, operational, and reputational value to Honeywell.

Warranty Cost Avoidance: By introducing an improved seal that improves Cabin Air Quality, there will be a boost in customer confidence, potentially reducing the LC seal related removals to zero. This will help Honeywell eliminate warranty and service costs.

Improved MTBUR (Mean Time Between Unscheduled Removals): The upgraded seal is expected to contribute to a notable increase in APU reliability, reducing unscheduled removals and improving fleet uptime.

Customer Satisfaction and Retention: With zero confirmed LC leaks related reports across 615 upgraded APUs and 473,000+ cycles, Honeywell has reinforced its reputation for quality and responsiveness, strengthening relationships with 16+ operators and 5 channel partners.

Brand Equity: The program reinforces Honeywell's image as a customer-centric innovator, capable of rapidly solving complex field issues with precision.

- **Clearly define the value of this program/project to your customer**

The program has delivered tangible operational and experiential benefits to Honeywell's customers, including airlines and OEM partners like Airbus.

For Airlines:
Improved Passenger Experience: The improvement of one of the possible causes of Odor In Cabin (OIC) events enhances in-flight comfort and customer satisfaction.

Reduced Operating Costs: Fewer APU removals and maintenance events translate to lower labor, parts, and downtime costs.

Operational Continuity: Enhanced reliability supports on-time performance, reducing delays and cancellations.

For Airbus:
Reduced APU Pull-Outs: The upgraded seal has led to a significant drop in APU removals, improving aircraft availability.

Minimized Disruptions: The elimination of LC seal-related issues has helped streamline operations and reduce customer complaints.

- **Clearly define the value of this program/project to members of your team; quantify if possible**

The program was a high-impact, high-visibility initiative that provided team members with opportunities for growth, recognition, and measurable achievement.

Professional Development: Team members gained hands-on experience in root cause analysis, rapid design iteration, supplier collaboration, and field validation.

Quantifiable Impact: The team's work directly contributed to 615 successful upgrades and 473,000+ incident-free cycles, a clear demonstration of engineering excellence. The root cause investigation program was launched in March 2021. A Field Evaluation Service Bulletin (SB) was released in May 2023 to upgrade 36 APUs spanning 6 participant Operators. With the success of the Field Evaluation, the SB was then extended in April 2024 to continue upgrading APUs for the 6 participating operators enabling 150 additional APU upgrades before the final SB was released on September 2024.

Recognition and Visibility: The program's success has been acknowledged across Honeywell's leadership and customer base, enhancing the team's professional standing.

Cross-Functional Collaboration: The initiative fostered a culture of agile teamwork, uniting engineering, quality, supply chain, and customer support functions.

- **Clearly define the contribution of this program/project to the greater good (society, security, etc.)**

Beyond corporate and customer benefits, the program contributes to aviation safety, passenger well-being, and environmental sustainability.

Broader Societal Impact: Enhanced Passenger Safety and Comfort: By improving Cabin Air Quality linked to oil leaks, the program improves the perceived and actual safety of air travel, making passengers feel more secure and comfortable.

Environmental Benefits: Fewer maintenance events and improved APU efficiency contribute to lower emissions and reduced environmental impact.

Aviation Reliability: The program supports the broader goal of safe, reliable, and efficient air travel, which is essential for global connectivity and economic resilience.

SECTION 3: ORGANIZATIONAL BEST PRACTICES AND TEAM LEADERSHIP

Value: 35 points

Use 12 pt. Times Roman typeface

Please respond to the following prompts:

- ***15 points:*** **Describe the innovative tools and systems used by your team, how they contributed to performance and why**

The success of the 131-9A APU seal redesign program hinged on the team's ability to rapidly identify the root cause of oil leaks and validate a robust solution under real-world conditions. This was made possible through the strategic use of innovative engineering tools, advanced diagnostics, structured processes, and a strong communication framework.

The first and most critical step was conducting a comprehensive Root Cause and Corrective Action (RCCA) using a Fault Tree Analysis (FTA). This method allowed the team to systematically investigate multiple potential causes of the oil leak. The breakthrough came with the identification of diverging coning behavior in the seals, a subtle deformation that was not immediately apparent through conventional inspection. Secondary potential causes of oil leak were identified in the FTA were also addressed in the new seal design.

To confirm this hypothesis, the team employed the ADINA Finite Element Analysis (FEA) tool, a sophisticated simulation platform capable of modeling complex thermal and mechanical interactions. ADINA enabled high-fidelity simulations of the seal under operational loads, clearly visualizing the deformation and validating it as the root cause. This modeling was instrumental in guiding the redesign of the seal geometry to eliminate the coning effect.

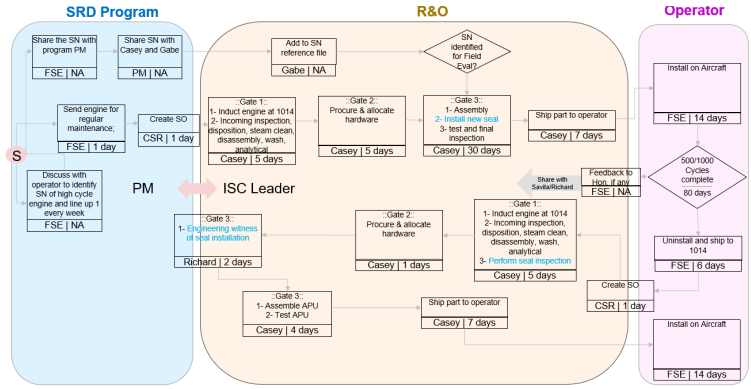
Once the new seal design was developed, the next challenge was to validate its performance across thousands of APU cycles. This was achieved through a combination of rig tests, accelerated engine testing, and most importantly, field evaluations. The team upgraded 36 APUs across 6 operators and conducted detailed inspections on 12 units after 500 and 1000 cycles. These field evaluations provided the most compelling evidence of the redesign's effectiveness, with zero reports of LC seal oil leaks.

Managing the tracking and performance data of these upgraded units in the field was a logistical challenge, addressed through Honeywell's Predictive Trend Monitoring and Diagnostics (PTMD) system. PTMD enabled real-time monitoring of APU cycles and performance trends, allowing the team to proactively plan inspections and validate field reliability with confidence.

Speed was a critical driver throughout the program. To streamline execution, the team followed the Honeywell In-Service Resolution Process (IRP), a structured framework designed to accelerate root cause identification and solution deployment. Additionally, the program was granted a special SEAL category (similar to US Navy SEALs indicating special high priority Service Related Difficulty operations/programs), ensuring top priority for funding, resources, and leadership attention.

Equally important was the program's communication strategy, which played a pivotal role in maintaining alignment and momentum. Weekly connects with program leadership, suppliers, Airbus, and internal stakeholders ensured rapid issue resolution. Quarterly updates to airline customers helped build trust and confidence in the solution.

In summary, the integration of advanced modeling tools like ADINA, real-world validation through PTMD, structured processes like IRP, and a robust communication framework enabled the team to deliver a high-impact solution with speed, precision, and lasting value.



End-to-End Program Planning

➢ ***10 points:*** **Define the unique practices and process you used to develop, lead and manage people?**

The success of the 131-9A APU seal redesign program was not only a result of technical innovation but also of strategic leadership and people-centric practices that empowered teams, engaged stakeholders, and accelerated execution. The program adopted several unique approaches to develop, lead, and manage people effectively across internal teams, suppliers, and customers.

One of the most impactful practices was the early engagement of the top six airline operators who had experienced the highest number of LC Seal removals. These operators were directly involved in the Field Evaluation (FE) phase, making them active contributors to the solution. This approach fostered a sense of ownership and partnership, allowing operators to provide real-time feedback on seal performance and installation. Their insights helped refine the solution early, while also building trust and transparency. Additionally, this engagement enabled hands-on training for Honeywell's Regional & Onsite (R&O) teams, ensuring they were well-prepared for a smooth Entry Into Solution (EIS) once the final design was released.

Another unique leadership decision was how the team addressed part shortages at Honeywell R&O centers, which could have delayed APU upgrades by 50–60 days per unit. Instead of waiting for APUs to return from the field, the team strategically selected upgrade candidates that were still in the assembly stage, just before shipment to customers. This proactive approach saved 50–60 days per APU, significantly accelerating the Field Evaluation timeline and enabling faster validation of the redesigned seal.

Despite significant challenges, the solution was released within three years by accelerating root cause analysis (first time right), field evaluation (reduced from 17 to 10 months), and part lead times (reduced from 18 to 6 months), while also working around Airbus Point Of Embodiment guidelines.

These practices were supported by a strong communication framework, including weekly connects with program leadership, suppliers, and Airbus, as well as regular updates to internal stakeholders and airline customers. This ensured alignment, rapid issue resolution, and confidence in the program's progress.

Honeywell | THE FUTURE IS WHAT WE MAKE IT

Honeywell Technical Update - 131-9A Load Compressor Seal Field Evaluation SB 131-49-8381FE

We are excited to share the significant progress on our field evaluation of the 131-9A Load Compressor Seal program. Our mission is to keep you informed on the progress and success of the project.

We already have 34 aircraft with 6 global airlines operating with the new seal design. To date we have had zero instances reported of odor in cabin events for the equipped aircraft. Additionally, we've successfully inspected six of the APUs that reached 500 cycles of operation. Below you will see pictures of some of these seals and the results are very encouraging, with no signs of oil contamination. This is the first step, and we expect the first APUs to reach the targeted 1,000 cycles and complete inspection by Feb 29th.

While we are very encouraged by these results, we still have to finish the 1000 cycle portion of the field evaluation. We will keep you posted on our progress monthly and

Technical Update to Cutomers on 131-9A LC Seal program status

In summary, the program's success was driven by inclusive stakeholder engagement, proactive planning, agile execution, and transparent communication. These people-focused practices not only accelerated the technical solution but also built a foundation of trust, collaboration, and shared success across all involved parties.

- ***10 points:*** **How did you leverage skills and technologies of your suppliers?**

Honeywell effectively leveraged the expertise of its seal supplier—a leading designer and manufacturer—by collaborating closely to overcome raw material and capacity constraints. Facing a 12–18 month lead time due to raw material shortages, Honeywell placed a risk-based purchase order for raw materials, enabling early procurement and cutting lead time by six months. Capital support helped the supplier expand capacity, while producibility issues were swiftly resolved by engaging a secondary supplier and deploying experts to fix tooling. This proactive partnership ensured seal availability ahead of Entry Into Service in May 2024, despite complex multi-tier supply chain challenges.

SECTION 4: DEALING WITH PROGRAM COMPLEXITY

(VOLATILITY, UNCERTAINTY, COMPLEXITY, AMBIGUITY, or VUCA)

Value: 25 points

Use 12 pt. Times Roman typeface

Please respond to the following prompts:

- ***10 points:*** **Describe UNIQUE areas of VUCA faced by your program and why. (Please avoid the issues surrounding Covid-19 pandemic, which was faced by all programs.)**
- ***15 points:*** **Explain how your team responded to these challenges. What changes did you make, what were the results?**

Volatility: Supply Chain Disruptions and Lead Time Risks

Challenge:

Owing to supply chain volatility, APU units remained in R&O centers for extended periods due to part shortages, delaying upgrades and the completion of 500- and 1000-cycle Field Evaluations. Additionally, the redesigned seal had a **12–18 month lead time** due to raw material shortages, threatening to delay the program by nearly a year.

Response:

Team mitigated these risks through intelligent planning, including collaboration with R&O centers for timely APU upgrades, which saved 50–60 days per unit. Team also placed risk-based orders for raw

materials early to secure inventory. Additionally, team supported suppliers with capital investments to expand capacity and ensure seal availability before Entry Into Service.

Uncertainty: Root Cause Identification and Interim Customer Support
Challenge:
The oil leak issue had persisted since 2019 despite previous attempts to resolve it using grooved hydrodynamic seals. The **true root cause remained elusive**, creating uncertainty around the effectiveness of any new solution. Meanwhile, operators continued to face LC seal removal events, impacting customer confidence.
Response:
Team addressed uncertainty with a dual-track strategy by utilizing advanced simulation tools (ADINA) to identify the seal's diverging coning behavior as the root cause on the first attempt. They also released a Best Practices guide to operators, offering maintenance instructions to alleviate symptoms during the development of a permanent solution.

Complexity: Multi-Stakeholder Field Evaluation and Execution
Challenge:
Managing 36 APUs across 6 operators in varied environments complicated by diverse maintenance practices necessitated coordination, cycle tracking, and data collection.
Response:
Utilizing Honeywell's Predictive Trend Monitoring and Diagnostics (PTMD) enabled real-time cycle and performance tracking. Close operator engagement facilitated feedback and coordination, while training R&O teams during Field Evaluation minimized complexities for full-scale implementation.

Ambiguity: Airbus POE and Service Bulletin process Constraints
Challenge:
Airbus Point Of Embodiment (POE) typically requires a gap between production release and Service Bulletin (SB) release.
Response:
This ambiguity was navigated through proactive stakeholder alignment by reaching an agreement with Airbus and operators to extend Field Evaluations until the SB release which allowed Honeywell to upgrade an additional 150 APUs before the final SB release**.**

SECTION 5: METRICS

Value: 15 points
Use 12 pt. Times Roman typeface

Please respond to the following prompts, where predictive metrics indicate items that provide a view of how yestrday's actions and today's actions will affect the future timeline, cost or other requirement.

Provide charts/graphs that illustrate performance to these metrics:

- **What are your predictive metrics?**
- **How did you perform against these metrics?**
- **How do your predictive metrics drive action toward program excellence? Please provide examples.**

Predictive metrics enabled the team to anticipate risks, prioritize actions, and maintain control over a highly dynamic and complex program. Honeywell leveraged a combination of technical analytics, operational forecasting, and program management tools to drive performance and ensure timely delivery.

1. Program Management Tools

Honeywell's program management framework provided several predictive tools to monitor program health: **Milestone Reporter** to track milestones and measure schedule performance using **Milestone Fidelity**, **Short Range Outlook (SRO)** to forecast real budget needs by accounting for uncertainties and upcoming risks, **Integrated Master Schedule (IMS)** for a comprehensive view of the program lifecycle, enabling proactive planning, **Earned Value Management System (EVMS)** to track cost and schedule performance using Schedule Performance Index (SPI) and Cost Performance Index (CPI).

Performance:

These tools ensured that the program remained on track and within budget, despite supply chain volatility and technical complexity.

How They Drove Action:

SPI and CPI trends triggered early interventions when deviations occurred, SRO enabled realistic budgeting and resource allocation, IMS helped align cross-functional teams on key deliverables and timelines.

2. Reliability Performance Analytics Report

What it Measured:,

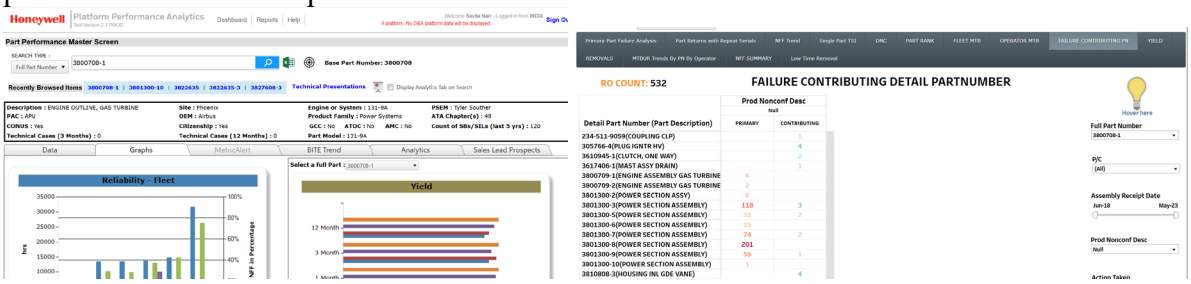
Mean Time Between Unscheduled Removals (MTBUR), Mean Time Between Failures (MTBF), Failure rates of the LC seal.

Performance:

This report revealed that LC seal was one of the leading causes for APU removals in the 131-9A fleet. This insight helped Honeywell prioritize the seal redesign as the most critical corrective action.

How It Drove Action:

By quantifying the severity and frequency of seal-related failures, the team was able to justify accelerated investment and resource allocation and secure SEAL program status (special category Service Related Difficulty program) for top-priority execution. It also helped Honeywell provide specific cleaning procedures for workshops.



3. Forecasting and Demand Planning

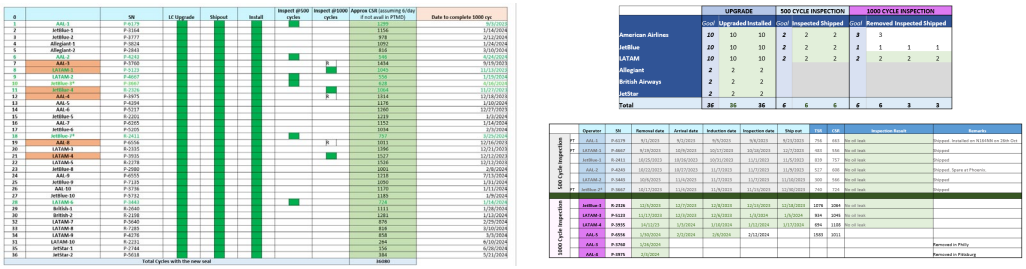
What it Measured:

Seal and part demand under multiple scenarios, Predicted cycle accumulation timelines for Field Evaluation APUs, Availability of raw materials and consumables

Performance:

Scenario-based forecasting helped Honeywell order seals with lead time 12-18 months with accuracy, despite ambiguity, enabled preorder of sunshine parts and consumables based on historical usage patterns to minimize disruptions due to part shortages during Field Evaluation.

How It Drove Action:
Enabled early procurement of critical parts, even before full validation, supported risk-based raw material ordering, reducing seal lead time by 6 months, Allowed dynamic adjustment of upgrade schedules based on real-time cycle tracking.

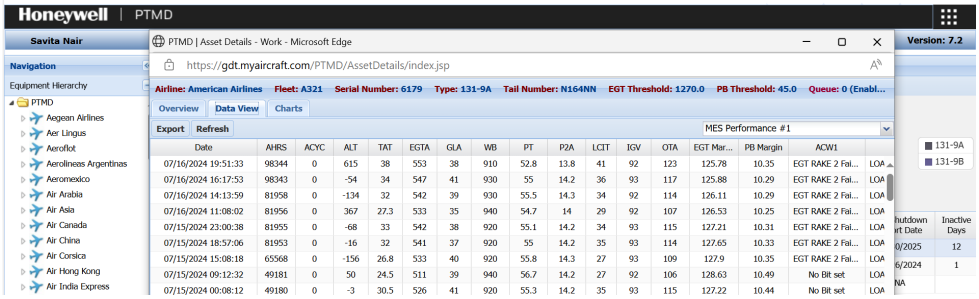


Field Evaluation upgrades and Inspection tracking

4. Predictive Trend Monitoring and Diagnostics (PTMD) and Upgrade Tracking
What it Measured:
APU cycle accumulation, upgrade progress across 36 Field Evaluation units, timing of inspections, teardowns, and reassembly.

Performance:
Using PTMD system and a detailed tracking sheet, the team accurately predicted when APUs would reach 500 and 1000 cycles for inspection.

How It Drove Action:
Enabled timely planning of teardown inspections, which helped prioritize APUs in the assembly stage to save 50–60 days per upgrade, ensured real-time visibility into Field Evaluation progress.



Predictive Trend Monitoring and Diagnostics (PTMD)