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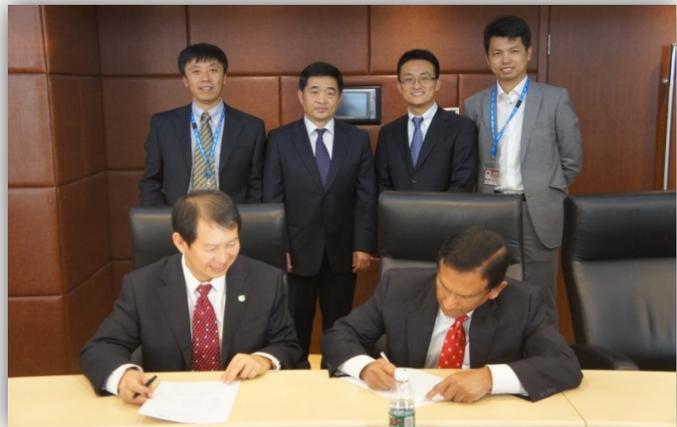
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PRI Signed an MOU with AVIC International

On November 14th 2014, Mr. Joe Pinto, the Executive Vice President & Chief Operating Officer of PRI visited AVIC International, and met with Mr. Zhang Hui, President, and Mr. Xu Tongyu, Vice President of AVIC International Aero-Development Corporation (AVICADE). Both parties signed a memorandum and agreed work together in the area of AS9100 certification, promote Nadcap special process accreditation and relevant trainings to provide comprehensive support to the premier Chinese suppliers who intend to enter the aerospace industry.

The Chinese aerospace manufacturing industry has been growing rapidly. Over the past few years, many private enterprises have entered the aerospace industry. But for most private enterprises, especially small and middle size

companies, it is still difficult to meet the high technical standards and to integrate into the international aerospace supply chain. Currently, most aerospace primes consider the aerospace quality management system (AQMS) certification(AS9100/9110/9120) and the Nadcap accreditation as a mandatory requirement and a prerequisite for obtaining customer orders. PRI, as the sole administrator of the Nadcap program, has the experience and resources in special process, AQMS certification and trainings; On the other hand, AVIC International, as the main business segment of AVIC and the primary linking channel between the Chinese and international aerospace industry has a distinct advantage in market development, contract negotiation, and other business services as part of aerospace manufacturing projects, and has been committed to the international aerospace subcontract projects since its establishment.



Mr. Xu Tongyu and Mr. Joe Pinto Signing Memo at AVIC International Plaza

The strategic cooperation between PRI and AVIC International will help more enterprises enter the aerospace supply chain, and will play a positive role in strengthening the foundation of the Chinese aerospace industry.

Nadcap Accreditation – The gateway to improved special processes of the aerospace manufacturing industry

Being the first Nadcap accredited Supplier in China, XI'AN AERO-ENGINE PLC (XAE) has already obtained Nadcap accreditation for 9 commodities, including Non-Destructive Testing, Heat Treating, Chemical Processing. After going through over 70 Nadcap audits, Mr. Tang Yongfeng, the Quality Manager of XAE would like to share with us about his understanding of the Nadcap program.

1. Help suppliers to line up with international standards

Driven Nadcap certification, XAE has brought in a large number of international standards and developed controlling procedures for the special processes. This has systematized the management of all the special processes and also made it more practical. In accordance with the Nadcap checklist requirements, the latest revisions of all relevant international standards were also introduced and implemented.

In the past we used to calibrate our testing machine against Chinese national standards, but Nadcap requires all the calibration to be based on international standards. For example, thermal couples and the alignment of mechanical testing machine are calibrated in accordance with the

international standards, which has helped with improving XAE's calibration system.

2. Improve customer requirements flow down

How to flow the top level design requirements to every step of operations, and to effectively pass expert knowledge and experience to the operator activities has been a challenge for the modern aerospace manufacturing industry. Especially the special processes are highly complex, merely relying on the quality manual and procedures is not sufficient. Through audits, Nadcap helps suppliers to meet customer-specific requirements and carry expert knowledge to daily operations. Most of the Nadcap accredited companies have significantly improved their special processes.

3. Facilitates teamwork and personnel development

Nadcap has scientific and stringent requirements on NCR responses. When working on corrective actions, a special emphasis is placed on teamwork. Teamwork is the key to successfully carrying out root cause corrective action. XAE has greatly benefited from team cooperation. Quality engineers and technicians worked closely throughout the process, utilizing collective wisdom, to integrate quality and technique in a way that makes the root cause analysis more effective. This has contributed to a higher standard of quality control in special processes. Meanwhile, our staff were tempered through training, communication, self audit, formal audit, implementation of corrective action, maintenance of quality system, and other practical work as required by Nadcap. We have brought up a large number of outstanding staff that



**Mr. Tang Yongfeng,
Quality Manager
of XAE**

helped us reaching a new level of the special process control and this is of great importance in improving the core competitiveness of our company.

4. An open learning platform

I have attended several Nadcap meetings and witnessed the checklist revision discussion during task group meetings. Attending the Nadcap meeting also gave me the chance of having face to face discussion with PRI staff engineers from various Task Groups. I was very impressed by their professionalism and efficiency.

In addition, PRI also offers high quality training courses that are related to Nadcap. Through these training courses, I have not only learned the key audit requirements of several commodities, but also acquired extensive technical knowledge. PRI instructors have excellent teaching skills and rich experience. They understand well what the training participants should focus on, teach the attendees according to their aptitude, and try to give as much knowledge as they can. I can still remember the courses I attended 5 years ago.

Nadcap is an open learning platform. Each audit is an opportunity for training against the international standards. Throughout this

“training”, attention is paid to the details of each standard, working documents and operating instructions. This is invaluable and it is the fundamental factor that determines the quality of our job.

5. Suggestions for successfully obtaining Nadcap accreditation

- ✓ Management should show great foresight and strong confidence, and provide necessary resources for the program.
- ✓ Build a professional team that includes both technicians and quality personnel, and promote teamwork.
- ✓ Carefully study internal standards, and put standardization before experience.
- ✓ The team should have a good level of English.
- ✓ Pay attention to technical details; conduct thorough internal audit. Nadcap auditors are experts in their field, they spend most of the time in witnessing the actual operating process, which is one of the significant differences between Nadcap and QMS audits.
- ✓ Establish an effective approach for coordination. Conduct root cause analysis in accordance with the Nadcap requirements and resolve problems systematically.

The benefit of Nadcap can not be easily seen in a short time, so be patient when you explore and go through the Nadcap process. Return will be promised through your persistence. XAE's significant progress in NDT and Materials Testing Laboratory is the result of our devoted efforts in Nadcap over the past years.



GUIDELINES FOR RESPONDING TO AUDIT FINDINGS:

Product Impact Issue (e.g. part was sprayed with uncertified material)

- a) Is this limited to one lot? Provide a description of what was done to review all similar products and to confirm or reject the possibility of this being a systemic problem.
- b) What parts were affected?
- c) Evidence of customer (specification/fixing process owner) notification and response.
- d) Evidence of conformance of all affected parts if they conform.
- e) Disposition of the affected parts if they do not conform.
- f) Was this situation caused by procedural incompleteness? (Change in procedure, training, supervision, and internal audits) If so, provide the revised procedure, the evidence of implementation, and training records for all those responsible for that procedure.
- g) Was this situation caused by non-compliance with the correct procedure(s)? If so, provide the reason (discipline issue, procedure not clear, insufficient training and/or supervision), training records for all those responsible for compliance with the procedure(s), and the evidence of implementation of corrective actions.

Specification Review Issue (e.g. internal procedure is not compliant with the specification)

- a) Why the procedure is not compliant? (Note: We are looking for a root cause. It is not adequate to state that the specification requirement was misunderstood. Consider the systemic issue of the specification review, and what portion of the system failed).
- b) Review was performed, but was not correct – were the right resources made available? Technical expertise, team as opposed to an individual, was the design authority consulted for confirmation of the interpretation, self-assess and determine if you truly have the technical expertise – either individually or internally, has enough time been allotted for a thorough review, is there a defined engineering resource in the organization, have the available training resources (internal/external) been consulted/utilized?
- c) Action to improve the specification review system based upon the identified root cause.
- d) Procedure revised.
- e) Procedure implemented (training, supervision).
- f) Implementation of procedure verified (internal audit).

Procedural Issue (e.g. document control procedure does not exist or needs revision):

- a) Why the procedure does not exist? (Note: We are looking for a root cause. It is not adequate to state that someone didn't know any better. The systemic issue of that person's failure to know, and what portion of the system failed needs to be addressed).
- b) Procedure created.
- c) Procedure implemented (training, supervision).



d) Implementation of procedure verified (internal audit).

Training and Qualification Issues (e.g. laboratory technician was not properly trained and qualified to perform all tests in his area of responsibility):

a) Why the technician was not qualified? (Note: We are looking for a root cause. It is not adequate to state that someone didn't know any better. The systemic issue of that person's failure to know, and what portion of the system failed needs to be addressed).

b) Why did the technician perform the work for which he was not qualified?

c) Is/are the qualification and training requirement(s) stated clearly in your Quality System procedures?

d) Identify all hardware processed/evaluated by the personnel.

e) Evaluate the potential impact on lab test results and, if any results are found questionable, notify the customer and submit the evidence of notification.

f) Identify all the hardware processed/evaluated by the personnel.

g) Submit the evidence of training to the procedure or to the revised procedure.

h) Re-training of relevant personnel is necessary whenever a procedure is revised.

i) Verify by internal audit.

Operator's Violation of Work Instructions that are "Correct":

a) Do the existing Quality System procedures clearly define the requirements for operator's compliance with written work instructions?

b) Were the operators trained to the above

procedures?

c) If so, address the Root Cause of the operator's failure to comply with the work instructions. Why was there a discipline problem, training problem, a failure to properly supervise the operator, etc.?

d) The potential impact on hardware has to be evaluated (see "**Product Impact Issue**"). Note: Any violation of a fixed/frozen process is to be dealt with as a "Product Impact Issue".

e) Systemically address the failure. This should include training, oversight, etc.

Operator's Violation of Work Instructions that are "Wrong":

a) Do Quality System procedures address the issue of unclear work instructions (operator reporting the existence of unclear or wrong instructions to his/her supervisor)?

b) If so, address the reason why the operator did not have the work instructions corrected. Provide evidence of systemic corrective actions - investigation of other operators who may not know that procedures have been revised and hence violated

the work instructions, provide evidence of training, and an internal audit plan.

c) If not, a procedure must be implemented, all personnel must be trained in it, and an internal audit plan must be provided for compliance with the new procedure.

Systemic Issue: (repeat finding from previous audit(s))

Response always needs to address the



verification of the effectiveness of the corrective action.

A recurrence of the problem indicates that the root cause was not adequately addressed or the follow-through was ineffective.

- a) Why your corrective action did not work?
- b) What are you going to do to make it work and prevent the recurrence? A minimum response of training/procedure change with internal audit verification.

Types of responses which do not contribute to resolving findings in an effective manner:

Supplier responses are difficult to follow. Too much "objective evidence" submitted.

Do not send the whole procedure, only the relevant page(s) and/or the page(s) with changes along with the evidence that the document has been approved. The relevant text is not highlighted. Evidence not identified with the associated finding number.

The supplier does not answer all the questions posted by the Staff Engineer or provide all the requested information.

Incomplete review of specification requirements. In many cases we receive a response indicating that there was no violation, but when the issue is addressed by the affected customer, it is discovered that there was a violation.

Stating that this is not a customer requirement. If Nadcap accreditation is a requirement, then compliance to the AS 7109 standards is mandatory. The only exception is if a customer requirement specifically addresses the subject matter and makes exception of it. Be aware that most of the AS7109 requirements are applications of AS9100 elements to coating-specific issues.

B. EXAMPLES OF SOME TYPICAL FINDINGS AND GUIDELINES FOR RESOLVING THEM:

In the following part we concentrate on root cause, product impact, and prevention of recurrence. An immediate corrective action is highly individual and usually self-explanatory.

NCR 00W: Lab technician was not using the correct evaluation criteria. The criteria were not defined clearly in the specification. The initial response must include:

Root Cause (why that happened)

Inadequate specification review: Consider whether the right resources were made available? Technical expertise, team as opposed to individual work, was the design authority consulted for the confirmation of the interpretation, self-assess and determine whether you truly have the technical expertise – either individually or internally, has there been enough time allotted for a thorough review, is there a defined technical resource within the organization, have the available training resources (internal/external) been consulted/utilized?

Product Impact:

- Determine the product's acceptance based on the lab test performed by the lab technicians.
- Submit the evidence of what parts, part numbers, lots were affected/not affected and based on what reasoning.
- Also consider the impact on the process, records, training etc.

Prevention of Recurrence – based on the specific root cause, make changes in the contract review procedure, along with training; additional supervision, if necessary, to support the implementation of changes; and a verification of the implementation (i.e. internal audit schedule).

Investigation Activities should identify all the evaluation criteria for areas that potentially could have a similar problem. A schedule must be provided to review and implement any changes.

NCR 00X: Parameters of spraying process in working instructions do not include tolerance limits. This is usually accompanied by the violation of the parameter simply because there is no tolerance limit attached to it.

The initial response should include:

Root Cause (why that happened)

- No procedural requirement: create (change) a planning and/or contract review procedure; train personnel; supervise the implementation; verify the implementation
- The relevant personnel (including operators) responsible for the transfer of data to work instructions are not aware of tolerance requirements: train - supervise - verify (internal audits)
- Other: in the case of parameter violation, address:

Product Impact:

- Find out the range of potential product impact
- Submit the evidence of what parts, part numbers, lots were affected/not affected and based on what reasoning.
- Notify the customer in writing that a parameter was violated for specified parts, **part quantity**, and submit the evidence of notification.

Prevention of Recurrence should include the procedure (change in the procedure), training, supervision, if necessary, as a means of implementation of changes, and verification of the implementation (i.e. internal audit schedule).

Investigation Activities should identify all the procedures that have this problem. A schedule must be provided to have the procedures corrected. If the "schedule" is to have them modified on an "as needed basis", a system must

be enacted and presented which prevents the use of the affected procedures until the revisions are made.

NCR 00Y: The powder used for coating was not certified to the required specification or the correct specification revision.

The initial response should address:

Root Cause (why that happened)

- Problem inspection – procedure, training or implementation
- Contract review and/or the problem-solving procedure, flow-down, training
- Material control problem: physical separation of approved material, the quality system does not properly address the ways how the material is fed into the production chain, negligence, procedure knowingly violated.

Product Impact:

- Find out the range of potential product impact.
- If all the parts, part numbers, lots were affected, notify the customer (specification/drawing owner) in writing and submit the evidence of it and provide customer feedback.
- If only a certain number of parts from that particular part number or lot was affected, submit the evidence to support this statement. Notify the customer (specification/drawing owner) in writing about the parts which were affected and submit the evidence of this notification and provide customer feedback.

Prevention of Recurrence should include the procedure (or change in the procedure) pertaining to receiving inspection, contract review and/or planning, or material control or any combination of these. Training to the new procedures (or changes to the existing procedures) has to be performed and the evidence submitted.

Implementation and verification of implementation have to be planned.

NCR 00Z: No certificates confirming the quality of process gases are available.

This is a frequent problem. Therefore, this repeating issue was submitted to the Task Group for resolution. The Task Group requires the confirmation of quality of process gases in the form of a certificate validated by the vendor for a maximum of one year. In other words, if your gas supplier delivers gases satisfying your customer specification or purity requirements, he needs to confirm it in writing. One certificate guaranteeing the quality of the delivered gases for period of one year is acceptable.

Note: The required gas quality has to be specified in your procedures.

The usual **Root Cause** in the above case is unawareness of the gas quality control requirement and, in some cases, difficulties related to obtaining certification of gas quality from the vendor.

NCR0XX: No evidence of identification of the cementation tooling.

The initial response should automatically include:

Root Cause (why that happened)

Procedural error: requirement not in the procedure -why?-planning?

Unawareness: add to procedure, train, supervise, verify the implementation.

Negligence: action taken to prevent, training, close supervision.

ID covered by repeat usage: why not reported as illegible, is there a procedure requiring the operator to report such deficiencies to prevent them from recurring?

Prevention of Recurrence should include a change in the way the tooling is being identified.

If necessary, train personnel to all the above changes, supervise the issue, internal audits.

NCR0YY: Certificate of conformance for alumina powder, lot #....., did not have any evidence of sieve analysis. Sieve analysis was required by the customer.

The initial response should include:

Root Cause (why that happened)

Failure of the requirement flow-down to PO as well as failure to receive inspection.

Planning issue and contract review. Does your QS address the flow-down of requirements to proper documents and locations? If not, revise the procedures and train the proper personnel.

Is the receiving party familiar with all the requirements and how is this guaranteed?

Product Impact has to be addressed:

The sieve analysis has to be done for the current lot and conformance verified.

Since no sieve analysis can be effectively done for previously used lots, the customer has to be notified (in writing).

Prevention of Recurrence should include training of all relevant personnel to all the procedural changes as well as plan how to verify the implementation of these changes.



Hosting eQuaLearn classes

Does your organization have a training room we may be able to use? Would you be interested in hosting an eQuaLearn training course? We offer free delegate training spaces to our host companies. Contact us by [email](#) for more information.

In November, Solar Atmospheres joined a long list of aerospace companies which have hosted eQuaLearn training, including Samsung, Firth Rixson and Monterrey Aerospace.

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Upcoming eQuaLearn Training

Course	Date	Venue
Nadcap Checklist Review – CT	12-13 Mar	Nagoya
Nadcap Checklist Review – HT	16-18 Mar	Suzhou
Introduction to Pyrometry	18-20 Mar	Suzhou
Root Cause Corrective Action	23-24 Mar	Suzhou
Heat Treating – Process Planner	24-27 Mar	Suzhou
Nadcap Checklist Review – NDT	30Mar-1Apr	Chengdu
NDT L3 Responsibilities	1-2 Apr	Chengdu
Nadcap Checklist Review – CP	8 Apr	Chengdu
Anodizing – Process Planner	9-10 Apr	Chengdu
Nadcap Checklist Review – CP	13 Apr	Kaohsiung
Anodizing – Process Planner	14-15 Apr	Kaohsiung
Root Cause Corrective Action	16 Apr	Kaohsiung
Nadcap Checklist Review – MTL	13-15 Apr	Kaohsiung
Nadcap Checklist Review – MTL	16-18 Apr	Shanghai

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