

Software Management for ATM Automation System in ATMB CAAC

Ren Sen, Guo Wei

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1. Software management current situation of ATCAS in ATMB CAAC

Status

Problems

Reasons

Content

objectives

Status

- 80 sets Air Traffic Control automation system in 44 sites of regional ATMB and branch ATMB.
- Main and backup systems in use.
- Provided by 9 manufacturers (5 domestic and 4 international).
- 29 software versions in use.

Problems

- Large number of Air Traffic Control automation systems.
- Many different manufacturers (Thales Indra Telephonics LES and so on).
- Long time span of the system software be put into operation.
- Obvious software differences.

Reasons

- Economic development level/ flight growth rapidly
- Equipment purchase Policy and purchasing pattern
- Manufacturer's technical Difference and Different design concepts.
- The controller's usage preferences.

Content

- The software management includes requirements management. (Core)
- Issue management.
- Version and Patch management.

objectives

- Unify the needs of controllers.
- Reduce the differences between existing systems.
- Reduce operational pressure and risks.
- Improve software operation safety level.

2. Software management and service architecture

Technical Center of ATMB

ATCAS Software Management system

Technical Center of ATMB

- The ATM Technical Testing and Validation Laboratory obtained the approval of CNAS.
- NUMEN and AIRNET test platform.
- A Simulated source system.
- THALES Software Support Center, INDRA Software Support Center.

ATCAS Software Management platform

- Technical center developed a management platform, deployed in the 7 regional ATMB and 37 sub-bureaus.
- Interconnect the whole system .
- Dynamic tracking and sharing information of all the sites .

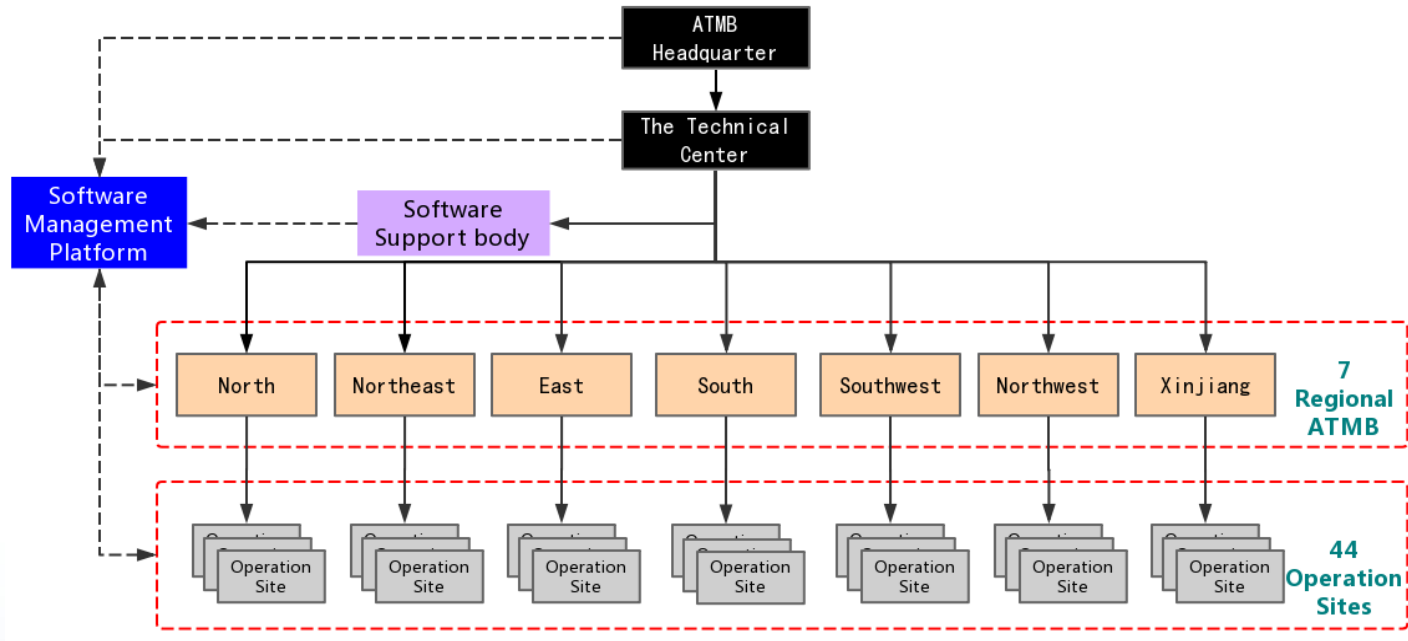


Figure 1. The software management architecture of ATM automation system in CAAC

3. Software management platform and management procedure

Obligation

Modification

ECR
Procedure

Implement

PCR
Procedure

Sample of
PCR & ECR
Form

Obligation

- ATM Automation System Software Management Regulations (MD-ATMB-2018-009).
- ATMB Headquarter – Supervision.
- The Technical Center of ATMB – Approval and Assessment.
- The Regional ATMB – Report and Implement.

Implement

- 44 Operation Sites.
- 3 Software Support Body.
- Issue investigation, code modification , software testing, system configuration modification and upgrade.
- Technical center will take part in the investigation

Modification

PCR Procedure

- Corrective
- Preventive

ECR Procedure

- Adaptive
- Perfective

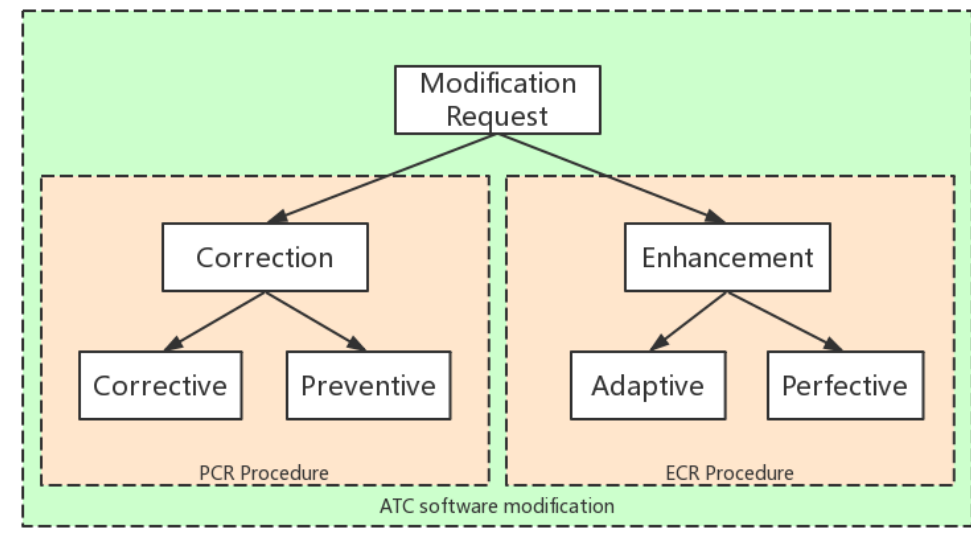


Figure 2. The ATM automation software modification

PCR Procedure

Status	Action
Creation	Operation Sites <ul style="list-style-type: none">- First Report Technical Center(Software Support Center) <ul style="list-style-type: none">- Reconfirm and Create PCR

Status	Action
Investigation	Technical Center(Software Support Center) <ul style="list-style-type: none">- identify and describe problems Manufacturer <ul style="list-style-type: none">- Perform code analysis



Status	Action
Modification	Manufacturer - Software coding and transition
Test	Test Procedure see Chapter IV
Close	Technical Center(Software Support Center) - Close PCR after Installation and Validation

ECR Procedure

Status	Action
Propose	Operation Sites <ul style="list-style-type: none">- Statement of new requirement
Assessment	The Regional ATMB <ul style="list-style-type: none">- Regional Assessment and Report- Technical Center- Transregional and Expert Assessment

Status	Action
Approval (ECR close)	<p>Technical Center</p> <ul style="list-style-type: none">- Approve after Assessment- Provide analysis results- Update the requirements (improvement) <p>ATMB Headquarter</p> <ul style="list-style-type: none">- Approve Crucial Requirements

Status	Action
Implement	<ul style="list-style-type: none">- The Regional ATMB- Test Procedure see Chapter IV- Installation and Validation



Sample of PCR & ECR Form

PCR No.			
生产厂家	优先级	版本分支	
报告现场	严重程度	软件版本	
联系人	现场编号	当前补丁	
联系电话	发生时间	平台类型	
故障现象描述及处置			
故障发生的时间和现象:			
故障造成的影响:			
故障处置:			
故障信息			
日志信息			
其他报告			
故障重现与故障调查 (以下现场不填)			
严重程度	故障类型		
故障编号	故障描述		
创建时间			
创建人	关联故障		
故障调查结论			
:			
:			
后续处理			
修复方法	计划修复时间		
	版本、补丁编号		
故障关闭			
关闭意见		处理时间	
		关闭人	

Figure 3. PCR Form

ECR No.			
生产厂家	审核单位	版本分支	
联系人	提出时间	软件版本	
联系电话	现场编号	当前补丁	
需求描述及技术方案			
必要性说明:			
需求实施前:			
需求的技术方案:			
调查研究 (以下现场不填)			
需求编号	需求描述		
创建时间	关联需求		
创建人			
处理意见			
:			
:			
需求关闭			
批复意见		处理时间	
		关闭人	

Figure 4. ECR Form

4. Software test procedure

Test Procedure

Lab Test Phases

Test Procedure

Status	Action
Submit	Manufacture <ul style="list-style-type: none">- Provide Document and affected software Technical Center(Software Support Center) <ul style="list-style-type: none">- Document review- Organize Lab Test

Status	Action
Lab Test	Software Support Center <ul style="list-style-type: none">- Experts, Maintainer, Controller- Test Phases and Products(later)- Test report submission



Status	Action
Release	Technical Center <ul style="list-style-type: none">- Test Report Evaluation- Release after evaluation(Patch, Version)
Installation	Operation Sites <ul style="list-style-type: none">- Run Field Test- Installation after the Field Test



Lab Test Phases

- I. Plan.
- II. Design.
- III. Execution.
- IV. Summary.

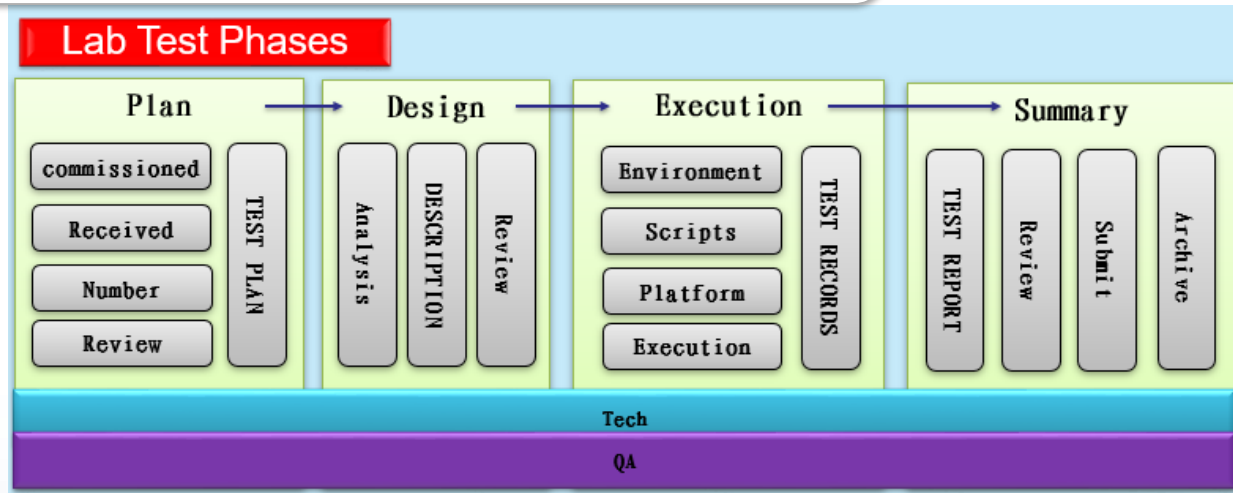


Figure 5. lab testing process of The ATM Technical Testing and Validation Laboratory

Phases	keywords	Products
Plan	- Commissioned and Review	TEST PLAN
Design	- Analysis Assessment Review	TEST DESCRIPTION
Execution	Preparation Environment Scripts and Platform	TEST RECORD
Summary	- Review - Reassess & Submit	TEST REPORT TEST PROBLEM REPORT



ICAO



中国民用航空局
空中交通管理局
Air Traffic Management Bureau, CAAC

THANKS FOR LISTENING

