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IMPROVING FLIGHT SAFETY ISSUES IN THE GLOBAL ASD (*AVIATION, SPACE & DEFENCE*) INDUSTRIES:

*Driven by the new AS/EN/JISQ 9100C -
series of QMS standards.*

By Lou MAGRITZER

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AUTHOR & PRESENTER: Lou MAGRITZER

- *Past National President, AOQ *International Ambassador, AOQ *Board Member, AOQ-NSW
- *Foundation President, College of Juran Medallists
- * Acn. – Academician International Academy for Quality
- *VP-APQO *ASQ-CSSGB *SM-ASQ
- *AOQ Delegate to ISO-TC/ 176/SC 2
- *RAB-QSA & IRCA Certified AS9100 AIE Lead Auditor
- *Principal, AQACI & OZ-Lean Six Sigma-Partners, based in Sydney, Australia

Email: amagritzer@optusnet.com.au

About the Paper and the PPTs:

*THE FOLLOWING SET OF PPTS ARE A SMALL FRACTION OF THE INFORMATION IN THE PAPER WRITTEN FOR THE INTERNATIONAL EOQ WORLD QUALITY CONFERENCE, JUNE 2011, BUDAPEST, HUNGARY, EUROPE.

*TITLED: IMPROVING FLIGHT SAFETY ISSUES IN THE GLOBAL ASD (AVIATION, SPACE & DEFENSE) INDUSTRIES.

“DRIVEN BY THE NEW AS/EN/JISQ 9100C-SERIES OF QMS STANDARDS” (AS IT IS LIMITED BY THE 25 MINUTES PRESENTATION TIME).

*THESE PPTs MAY HAVE ADDITIONAL INFORMATION FOR CLARIFICATION AND KNOWLEDGE REINFORCEMENT PURPOSES.

* FOR FURTHER RELATED INFORMATION PLEASE EMAIL TO : Lou MAGRITZER (amagritzer@optusnet.com.au)

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BEFORE WE ASK THE FIRST QUESTION ON
FLIGHT SAFETY AND/OR AIRWORTHINESS

WE SHOULD AGREE ON A
DEFINITION OF FLIGHT SAFETY: i.e.

“FLIGHT SAFETY IS THE RESULT OF:

QUALITY”

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THE FIRST QUESTION ON FLIGHT SAFETY

AND/OR AIRWORTHINESS SHOULD BE:

ARE AS9100C + LEAN SIX SIGMA-

ABLE TO IMPROVE FLIGHT SAFETY/

AIRWORTHINESS SIGNIFICANTLY AND

THUS PREVENT OR REDUCE

MOST ASD - DISASTERS

THE SHORT ANSWER MUST BE-

“YES”

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*THESE TWO YOUNG & POWERFUL PARTNERS i.e.

AS9100C + LEAN SIX SIGMA-

ARE DESIGNED TO HELP PRODUCE MUCH

SAFER QUALITY PRODUCTS AND SERVICES
AND TO DELIVER IT, MORE OFTEN ON-TIME.

***WHY?** THROUGH ONGOING **VARIATION CONTROL**,
PLUS **DEFECT AND ERROR REDUCTION**.....

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*TOGETHER,

AS9100C + LEAN SIX SIGMA-

WHEN PROPERLY APPLIED,

CAN BRING THE EARLY **WARNING SIGNALS,**
CONTROLS AND **ASSURANCES,**

INTO ANY **PROCESS,**

OF ANY MANUFACTURING OR SERVICE
ORGANISATION.

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*REGARDLESS OF **CONTRACT SIZE OR PRODUCT** ,
THESE TWO RATHER MODERN

MANAGEMENT TOOLS i.e.

AS9100C + LEAN SIX SIGMA-

HAVE REGULARLY BEEN ABLE TO ENHANCE
QUALITY, CUSTOMER SATISFACTION,
PROFITABILITY & FLIGHT SAFETY

AND THUS ENSURING

LONG-TERM **BUSINESS SURVIVEABILITY**

INTRODUCTION:

* **AS9100, AS9110 AND AS9120**, A TRIPLE SET OF ASD-QMS REQUIREMENTS STANDARDS, REVISED IN 2009, ARE TO SERVE ALL **ASD-ORGANISATIONS**, OF THE WORLD'S 208 NATIONS.

*THESE THREE ISO 9001:2008-BASED INTERNATIONALLY RECOGNISED NORMATIVE AS-STANDARDS, COVER MANUFACTURING , MAINTENANCE AND STOCKISTS OF SPARE PARTS, RESPECTIVELY.....

INTRODUCTION:

*FURTHER MORE, THESE THREE **AS- STANDARDS** ARE FIT FOR ANY OTHER DEFENCE OR CIVIL CUSTOMERS / INDUSTRIES, THAT WANT TO AIM FOR A MUCH MORE RIGID AND RISK_BASED QMS, THAN ISO 9001 ALONE IS ABLE TO PROVIDE.....

WHERE DOES LEAN SIX SIGMA FIT IN ??

***AS9100:2009 REV. C**, TOGETHER WITH STATISTICAL **LEAN SIX SIGMA** PROCESS IMPROVEMENT TOOLS, SURELY MAKE-UP THE MOST POWERFUL STATE-OF-THE-ART SET OF **VARIATION CONTROL TOOLS**, BEFORE UNKNOWN TO MANKIND.

*THE ABOVE **TWO QA TOOLS** CAN PROVIDE **SIX SIGMA QUALITY PERFORMANCE**, AND **ACHIEVE ON-TIME DELIVERY OF QUALITY PRODUCTS SERVICES**, AND **THUS GAIN OPTIMUM CUSTOMER SATISFACTION AS WELL AS IMPROVED FLIGHT SAFETY !!!!**

IS THE QMS FIT FOR THE PURPOSE?

***AS9100 AND LEAN SIX SIGMA** ARE DESIGNED TO KEEP AIRCRAFT IN THE AIR MUCH LONGER, WITH REASONABLE **LOW RISK** .

***LESS RISK TRANSLATES INTO INCREASE IN FLIGHT SAFETY!!!!**

***TOP LEVEL SUPPORT FOR CONTINUAL APPLICATION OF THE 8 ISO 9001 & AS9100 QM PRINCIPLES IS VITAL; AS IT WILL HELP MAINTAIN FITNESS FOR PURPOSE AND HELP TO ACHIEVE PLANNED BUSINESS RESULTS.**

THE ISO 9001:2008 PDCA MODEL:

***ISO 9001** AND THE **AS9100** SERIES OF ASD-STANDARDS EACH SHOW ONLY ONE FIGURE I.E.

***FIGURE 1- MODEL FOR A PROCESS -BASED** QUALITY MANAGEMENT SYSTEM (QMS),

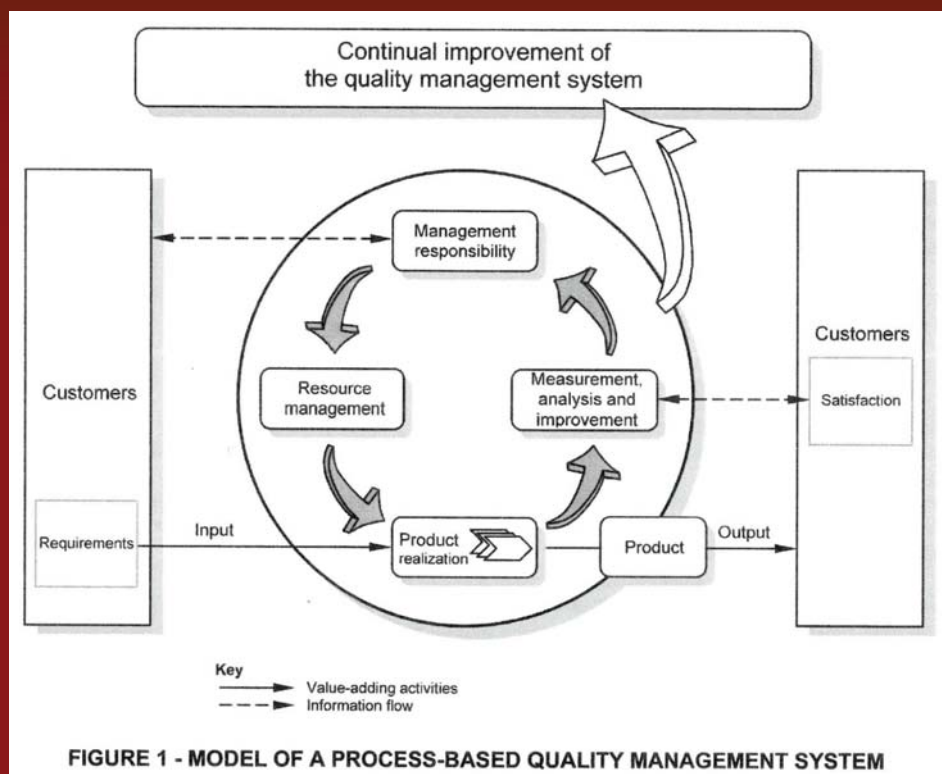
***IT DEPICTS** THE 4 **CONTINUAL** IMPROVEMENT STEPS OF THE ISO 9001 QMS i.e.

THE “**PLAN –DO-CHECK –ACT**” (PDCA) **PROCESS CYCLE** aka “PLAN-DO-STUDY-ACT” (PDSA) CYCLE.

(See next Slide)

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Fig. 1 – Concepts relating to Quality



QUALITY MANAGEMENT PRINCIPLES (QMPs)

***EIGHT QMPs FORM THE BASIS OF THE QMS STANDARDS WITHIN THE ISO 9000 AND AS9100 FAMILIES.**

***ADOPTION AND CONTINUAL APPLICATION OF THESE 8 QM PRINCIPLES HELP ORGANISATIONS TO IMPROVE PERFORMANCE, CUSTOMER SATISFACTION.**

***AND MOST IMPORTANT IMPROVED FLIGHT SAFETY, DUE TO REDUCED RISKS OF PRODUCT FAILURE.**

See next Slide.....

THE 8 QUALITY MANAGEMENT PRINCIPLES (QMP)

QMP 1- CUSTOMER FOCUS

(No customers- No business)

QMP 2- LEADERSHIP

(Flow down from Top Management)

QMP 3- INVOLVEMENT OF PEOPLE

(Use their abilities from all levels)

QMP 4- PROCESS APPROACH

(Manage all activities and resources as a Process)

Continued next slide.....

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QUALITY MANAGEMENT PRINCIPLES (QMP) Cont.

QMP 5- SYSTEMS APPROACH TO MANAGEMENT

(Manage interrelated Processes as a System-to achieve organisational goals/ objectives, especially for Flight Safety)

QMP 6- CONTINUAL IMPROVEMENT (CI)

(Aim for CI of the Organisation's performance)

QMP 7- FACTUAL APPROACH TO DECISION MAKING-

(Analyse Data, Info & Statistics to make effective decisions)

QMP 8- MUTUAL BENEFICIAL SUPPLIER RELATIONSHIPS

(It helps to create value (\$) and security for all parties)

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ISO 9001 & AS9100 REQUIRE FULL DOCUMENTATION OF THE QMS.

A TYPICAL SET OF QMS DOCUMENTS SHALL INCLUDE AS A MINIMUM UPDATED AND CONTROLLED VERSIONS OF :

***QMS STANDARDS**

***QUALITY POLICY**

***QUALITY MANUAL**

***QUALITY PLANS**

***SPECIFICATIONS & DRAWINGS**

***GUIDELINES**

***PROCEDURES**

***WORK INSTRUCTIONS**

***RECORDS**

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WHAT ARE SOME OF THE IN-FLIGHT DANGERS ?

SAY, AT MEAL TIME!!!

SAY, 10 MINUTES AFTER GETTING SERVED!!

SAY, EVERYBODY ON BOARD IS ENJOYING THE MAIN COURSE!!

THE FORKS & KNIFES ARE DOING A GOOD JOB,

**UNTIL SAY, A DOZEN OF NEIGHBOURING PASSENGERS,
PURPOSE FULLY DISPERSED FROM FRONT TO REAR OF THE
PLANE, GET A SIGNAL,**

TO DO WHAT THEY WERE TRAINED FOR.

SOON.....

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FLIGHT SAFETY AT RISK!!!!



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More Killer Weapons!!!!!!!!!!!!!!

ARE SERVED



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**KARL AND I AGREED THAT FORKES ARE
MORE DANGEROUS
THAN BLUND KNIVES!!**



WHAT ARE SOME OTHER COMMON POTENTIAL HAZARDS TO FLIGHT SAFETY?

***SOME OF THE CAUSES AND ROOT CAUSES THAT CAN LEAD TO NEAR DISASTER AND/OR TOTAL DISASTER!**

***SOURCE: TABLE 2.1 SUSPECT HUMAN ERROR DEFECTS (SHEDS)- SOURCE: AUS-CAA-CASA FOR (6 YEAR PERIOD 1993-1998) ANALYSED BY L.M.**

***REDUCED TABLE # 2.1 FINDINGS:**

THE 3 TOP SHEDS AVERAGES/YEAR ARE:

- 1. INCORRECT ASSY-WITH -101-REPORTS,**
- 2. BOGUS PARTS ASSY. OPS - WITH -31- REPORTS**
- 3.. INCORRECT PARTS - WITH -27- REPORTS
(159 ERRORS TOO MANY)**

See next.....

WHAT ARE SOME OTHER COMMON POTENTIAL HAZARDS TO FLIGHT SAFETY?

***SHEDS and HEDS (SUSPECT HUMAN ERROR DEFECTS) and HEDS (HUMAN ERROR DEFECTS)**

***EXAMPLES OF DEFECTS and ERRORS REPORTED BY CASA OVER THE YEARS.**

See Next Slide....

WHAT ARE SOME OTHER COMMON POTENTIAL HAZARDS TO FLIGHT SAFETY?

ITEM-SHEDS TOTALS:	Y 1998	Totals : 6 Years	Average/Year
1-Incorrect Assy. Op	86	607	101
2-Bogus Parts	24	183	<31
3-Incorrect Parts	16	164	27
4-Missing Parts	23	101	<17
5-MFG. Error	15	94	<16
6-Illegal Repairs	11	78	13
7-Inadequate Maintenance	12	72	12
8-Pilot/Passenger Error	14	52	<9
9-Other	74	484	<81
FIG. 2.1- SHEDS- 6 years- 1993- 1998- Info fromCASA data. QUALCON 2000 Sydney	T 275	T 1835	T<306

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SOURCE: ISO 9000:2006

THE ROLE OF STATISTICAL TECHNIQUES:

***IS TO HELP ANY AS9100 QMS EFFORTS AND LEAN SIX SIGMA PROJECTS TO:**

***UNDERSTAND VARIABILITY AND SOLVE PROBLEMS**

***BETTER UNDERSTAND THE VARIABILITY'S NATURE, EXTENT AND CAUSES.**

***FACILITATE BETTER USE OF AVAILABLE DATA**

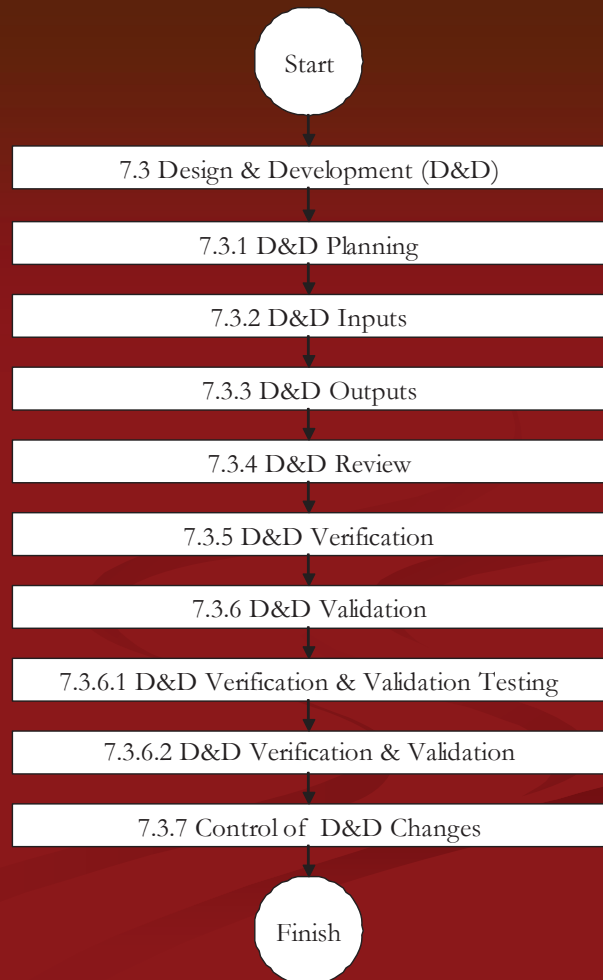
***ASSIST IN BETTER DECISION MAKING THROUGHOUT THE PRODUCT LIFE CYCLE TO ENHANCE FLIGHT SAFETY**

***SEEK GUIDANCE FROM ISO/TR 10017**

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**AS9100 C (2009)
CLAUSE 7.3**

***A 9 STEP ISO DESIGN
& DEVELOPMENT
(D&D) PROCESS FLOW
CHART**



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**WHAT ABOUT THE AVIATION MAINTENANCE
ORGANISATIONS ?**

***AS9110 REV-A (2009) QMS REQUIREMENTS REFER.**

***THIS ASD STANDARD INCLUDES ISO9001:2008 QMS
REQUIREMENTS AND ADDITIONAL AVIATION
MAINTENANCE INDUSTRY REQUIREMENTS**

***AS 9101D – ASD- AUDIT QMS LISTS ABOUT 80
AVIATION -AUDIT REQUIREMENTS**

***IT INCORPORATES ISO9001:2008 CHANGES**

***EXPANDED SCOPE FOR LAND, AIR AND SEA BASED
SYSTEMS FOR DEFENCE OPERATIONS, AS9121A
CHECKLIST**

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**SAE STANDARD AS5553 COVERS SUPs
(SUSPECT UNAPPROVED PARTS) IE
COUNTERFEIT ELECTRONIC PARTS:**

***TO ENSURE THEIR AVOIDANCE, DETECTION,
MITIGATION & DISPOSITION**

***AS5553 STANDARDISES THE REQUIREMENTS
PRACTICES AND METHODS TO REDUCE
COUNTERFEIT PARTS (aka BOGUS PARTS) ENTERING
THE GLOBAL SUPPLY CHAIN.**

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**AS9100 C: ADDED 4 INDUSTRY SPECIFIC
TERMS& REQUIREMENTS**

- 3.1 RISK- UNDESIRABLE**
- 3.2 SPECIAL REQUIREMENTS**
- 3.3 CRITICAL ITEMS**
- 3.4 KEY CHARACTERISTICS**
- + 1 NOTE SPECIAL CHARACTERISTICS**

***WHICH FOCUSES ON THE IMPORTANT ASPECTS OF
PRODUCTS AND PROCESSES THAT HAVE A MAJOR
IMPACT ON QUALITY- RISKS- SAFETY- FLIGHT SAFETY
ETC.**

Recognition to my Chinese Quality Friends

- *Thanks to fellow Acn. Prof. XU Jichao, and Prof. LIU Yumin for their cooperation over many years teaching in China, to make me a better Quality and Six Sigma professional.*

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Acn. A.P. Lou MAGRITZER

OZ-Lean Six Sigma-Partners

Your Lean Six Sigma Source
QMS + EMS + OHS Consultant,
Trainer, Coach, Lecturer, Auditor
IRCA + RABQSA Lead Auditor-Aerospace
AS 9100 + ISO 9001 Trainer-Coach-Auditor



AQACI & Oz-Lean Six Sigma-Partners
POB 115, Merrylands, NSW, 2160, Australia

T/F: Sydney 61+2+9760-0315 Mob: 61+412-412-123
Email: amagritzer@optusnet.com.au
www.aoqns.com.au www.apqo.org

Acn. A.P. Lou MAGRITZER

OZ-Lean Six Sigma-Partners

AQACI & OZ-Lean Six Sigma-Partners
POB 115, Merrylands, NSW, 2160 Australia

T/F: Sydney 61 +2+9760-0315 Mobile: 61+(0)412-412-123
Email: amagritzer@optusnet.com.au
www.aoqns.com.au www.apqo.org

国际质量科学院院士 (IAQ)
世界质量理事会副总裁 (WQC)
亚太质量组织副总裁 (APQO)
澳大利亚质量协会前总裁 (AOQ)
朱兰学院总裁(AOQ-COLLEGE JURAN MEDALLIST)
澳大利亚质量保证咨询顾问公司总裁 (AQACI)
上海市2001年白玉兰质量奖获得者 (SFE-CAQ)



Acn. 马格里撒 卢

AQACI & OZ-Lean Six Sigma-Partners
POB 115, Merrylands, NSW, 2160 Australia
T/F: Sydney 61+2+9760-0315 Mobile: 61+(0)412-412-123
Email: amagritzer@optusnet.com.au
www.aoqns.com.au www.apqo.org

Acn. A.P. Lou MAGRITZER
OZ-Lean Six Sigma-Partners

QMS + EMS + OHS Consultant, Trainer, Coach, Lecturer, Auditor
IRCA + RABQSA Lead Auditor-Aerospace AS 9100 + ISO 9001

Acn. IAQ, PE in QE, PASQ, CQE + CQA, Hon. F. AOQ, Prof. Henan Prov.
M. IQA + IAME + SAE + RAeS + WTIA + Life M. APQO + SM SME
Mgmt. Dipl. AIEEx - UNSW, AQTF Workplace Assessor/Trainer Cert. 4,
VP - APQO, Past. Pres. AOQ, President College of Juran Medallists,
Juran Medal 1995 + Shanghai Magnolia Award 2001 + SFE-CAQ 2002

AQACI & OZ-Lean Six Sigma-Partners
POB 115, Merrylands, NSW, 2160 Australia
T/F: Sydney 61 +2+9760-0315 Mobile: 61+ 412-412-123
Email: amagritzer@optusnet.com.au
www.aoqns.com.au www.apqo.org

Thirteen Fundamental QUALITY Truths.

- All **QUALITY** organizations, companies, divisions, sections, departments, units, teams and projects should have a documented mission that links them into a chain that holds the organization together, keeping it directed at pulling in all of the potential **QUALITY** customers that they can handle.
- All **QUALITY** processes should have a defined customer whose needs and expectations are understood and which are being met.
- No **QUALITY** process is so good that it can't be improved although some processes need improvement more than others.

- There is always a better QUALITY way of doing things.
- The greatest competitive advantage is knowledge that leads to QUALITY innovation.
- QUALITY People who understand why they do something do it better and faster.
- When something gets measured, it gets QUALITY attention
- There is a direct correlation between internal customer QUALITY satisfaction and external customer QUALITY satisfaction.
- Every organization has an obligation to provide QUALITY value to the people that invest their hard-earned money and time into the organization.
- Expended resources related to the organization's employees is a QUALITY investment, not a cost.
- the elimination of waste is everyone's QUALITY job.
- Management needs to set the QUALITY example and set the QUALITY talk.
- Each individual needs to be sure that his/her QUALITY suppliers understand what is needed and not ask for things that won't be used.

Original by Acn. James Harrington, 1986
 Modified by Acn. Lou MAGRITZER, 2011.

AS9101D AUDIT PROCESS FLOW

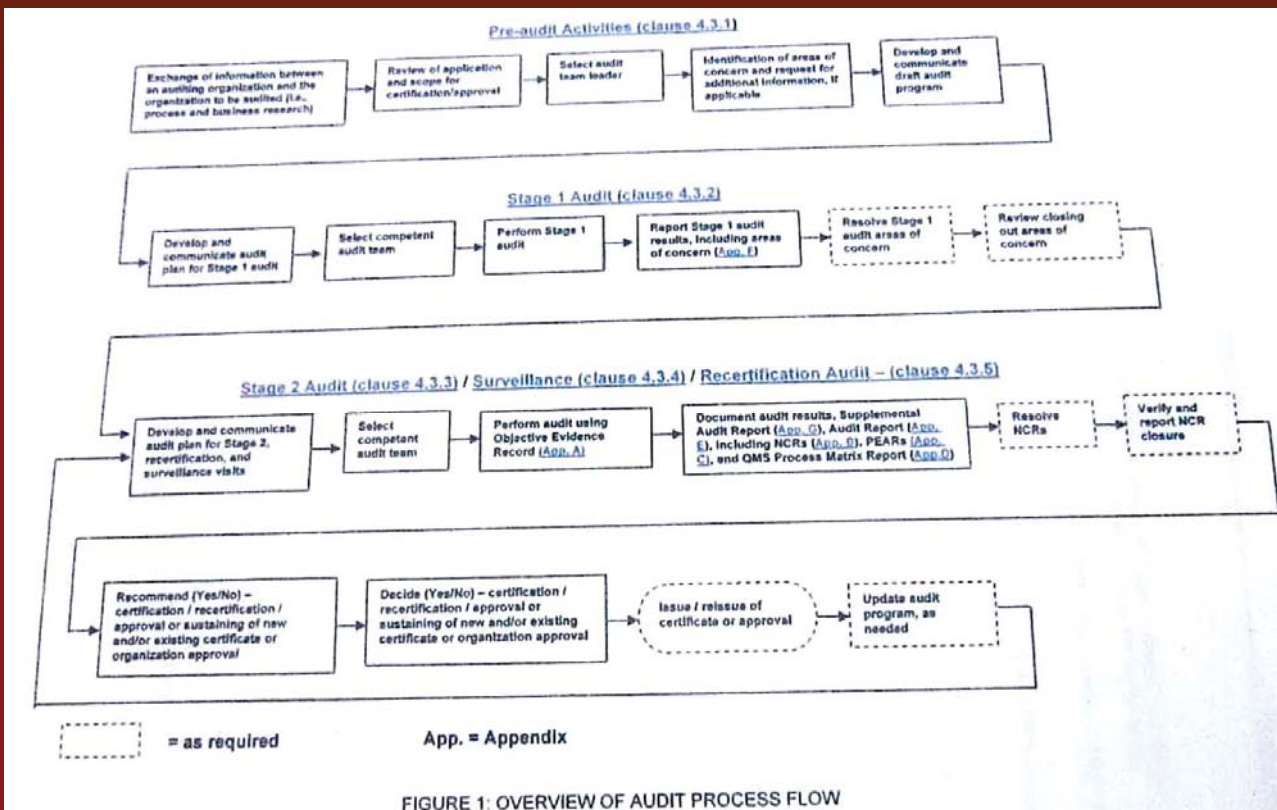


FIGURE 1: OVERVIEW OF AUDIT PROCESS FLOW