BEAR STEARNS

Securities Industry Association

Sarbanes Oxley from the IT Practitioner's Point of View

October, 2004

Introduction

- Influences on Bear Stearns' approach
- Bear Stearns IT Strategy

SOX Section 404

SEC. 404. MANAGEMENT ASSESSMENT OF INTERNAL CONTROLS.

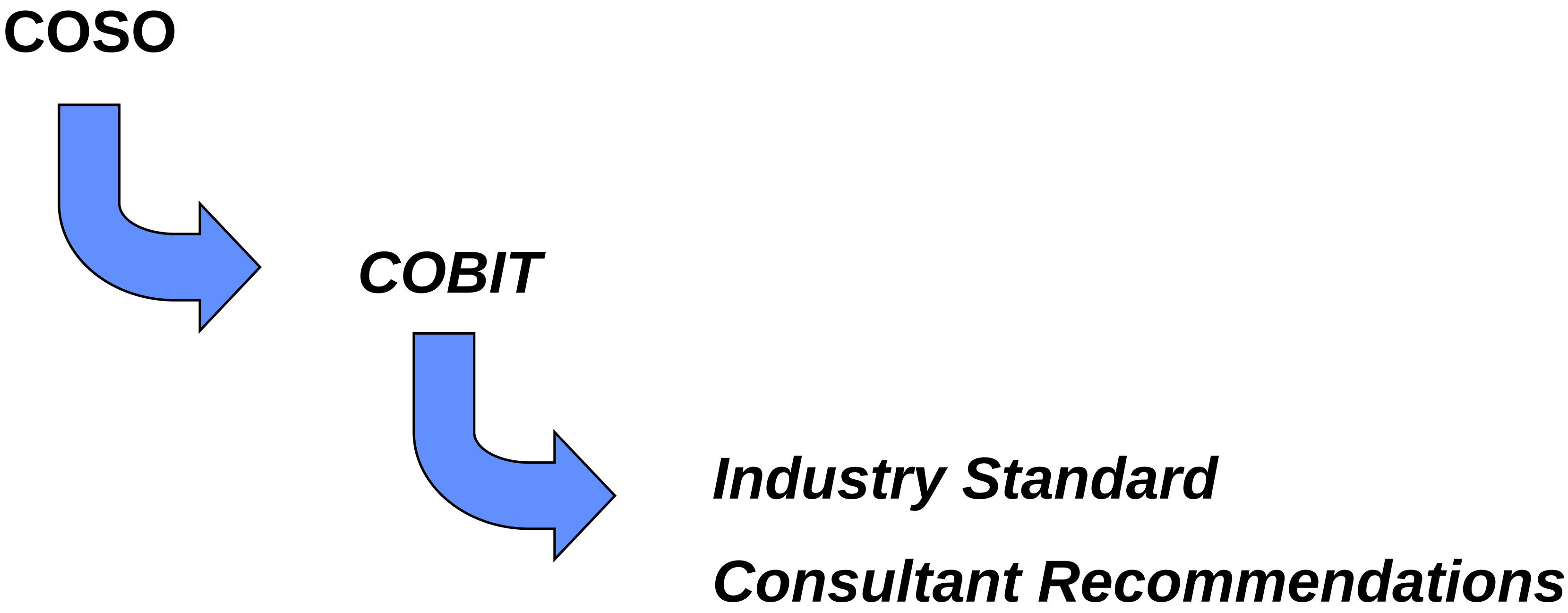
(a) RULES REQUIRED.—The Commission shall prescribe rules requiring each annual report required by section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m or 78o(d)) to contain an internal control report, which shall—

(1) state the responsibility of management for establishing and maintaining an adequate internal control structure and procedures for financial reporting; and

(2) contain an assessment, as of the end of the most recent fiscal year of the issuer, of the effectiveness of the internal control structure and procedures of the issuer for financial reporting.

(b) INTERNAL CONTROL EVALUATION AND REPORTING.—With respect to the internal control assessment required by subsection (a), each registered public accounting firm that prepares or issues the audit report for the issuer shall attest to, and report on, the assessment made by the management of the issuer. An attestation made under this subsection shall be made in accordance with standards for attestation engagements issued or adopted by the Board. Any such attestation shall not be the subject of a separate engagement.

Generally Accepted Standards



COSO

COBIT

Industry Standard

Consultant Recommendations

COSO

- **Control Environment**

  The tone is set at the top!

- **Risk Assessment**

  Internal control risks

- **Control Activities**

  General controls plus application controls

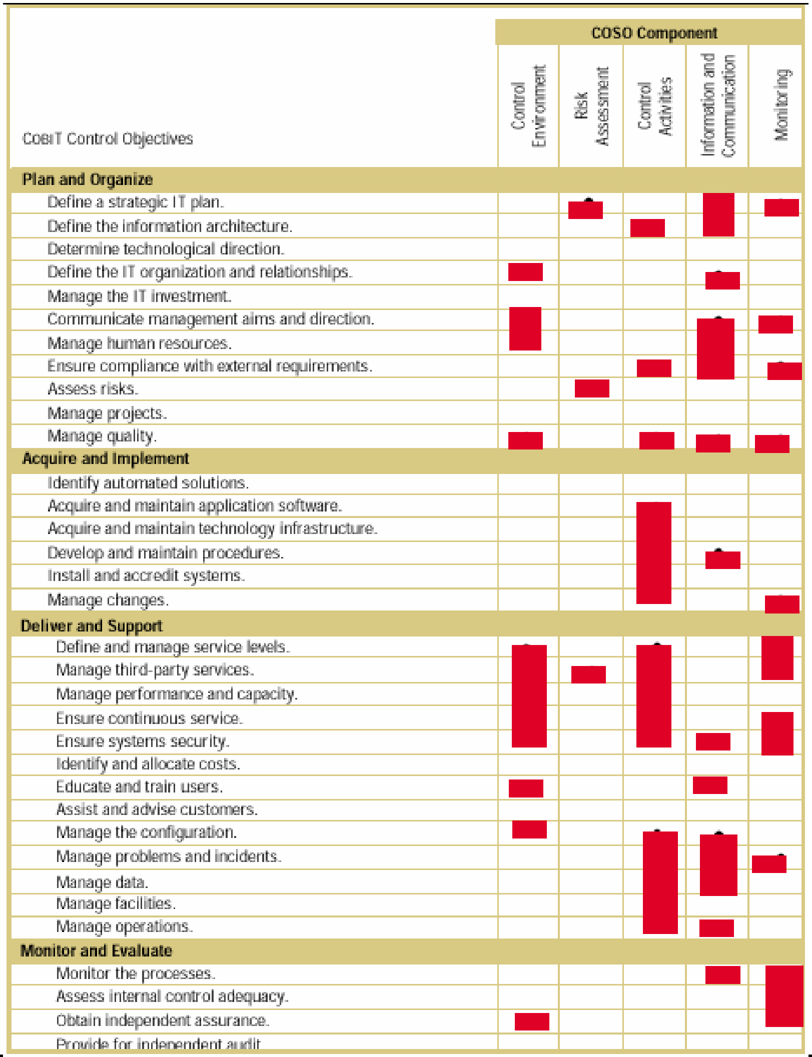
- **Information and Communication**

  Roles and responsibilities awareness

- **Monitoring**

  Metrics

Control Objectives for Information Technology



COBIT Control Objectives	Control Environment	Risk Assessment	Control Activities	Information and Communication	Monitoring
	COSO Component				
Plan and Organize					
Define a strategic IT plan.		🟥		🟥	🟥
Define the information architecture.			🟥	🟥	
Determine technological direction.					
Define the IT organization and relationships.	🟥			🟥	
Manage the IT investment.					
Communicate management aims and direction.	🟥			🟥	🟥
Manage human resources.	🟥			🟥	
Ensure compliance with external requirements.			🟥	🟥	🟥
Assess risks.		🟥			
Manage projects.					
Manage quality.	🟥		🟥	🟥	🟥
Acquire and Implement					
Identify automated solutions.					
Acquire and maintain application software.			🟥		
Acquire and maintain technology infrastructure.			🟥		
Develop and maintain procedures.			🟥	🟥	
Install and accredit systems.			🟥		
Manage changes.			🟥		🟥
Deliver and Support					
Define and manage service levels.	🟥		🟥		🟥
Manage third-party services.	🟥	🟥	🟥		🟥
Manage performance and capacity.	🟥		🟥		
Ensure continuous service.	🟥		🟥		🟥
Ensure systems security.	🟥		🟥	🟥	🟥
Identify and allocate costs.					
Educate and train users.	🟥			🟥	
Assist and advise customers.					
Manage the configuration.	🟥		🟥	🟥	
Manage problems and incidents.			🟥	🟥	🟥
Manage data.			🟥	🟥	
Manage facilities.			🟥		
Manage operations.			🟥	🟥	
Monitor and Evaluate					
Monitor the processes.				🟥	🟥
Assess internal control adequacy.					🟥
Obtain independent assurance.	🟥				🟥
Provide for independent audit					

COSO Components

COBIT Control Objectives

🟥 Controls that focus on COSO objectives

COBIT is a product of the Information Systems Audit and Control Association, www.isaca.org

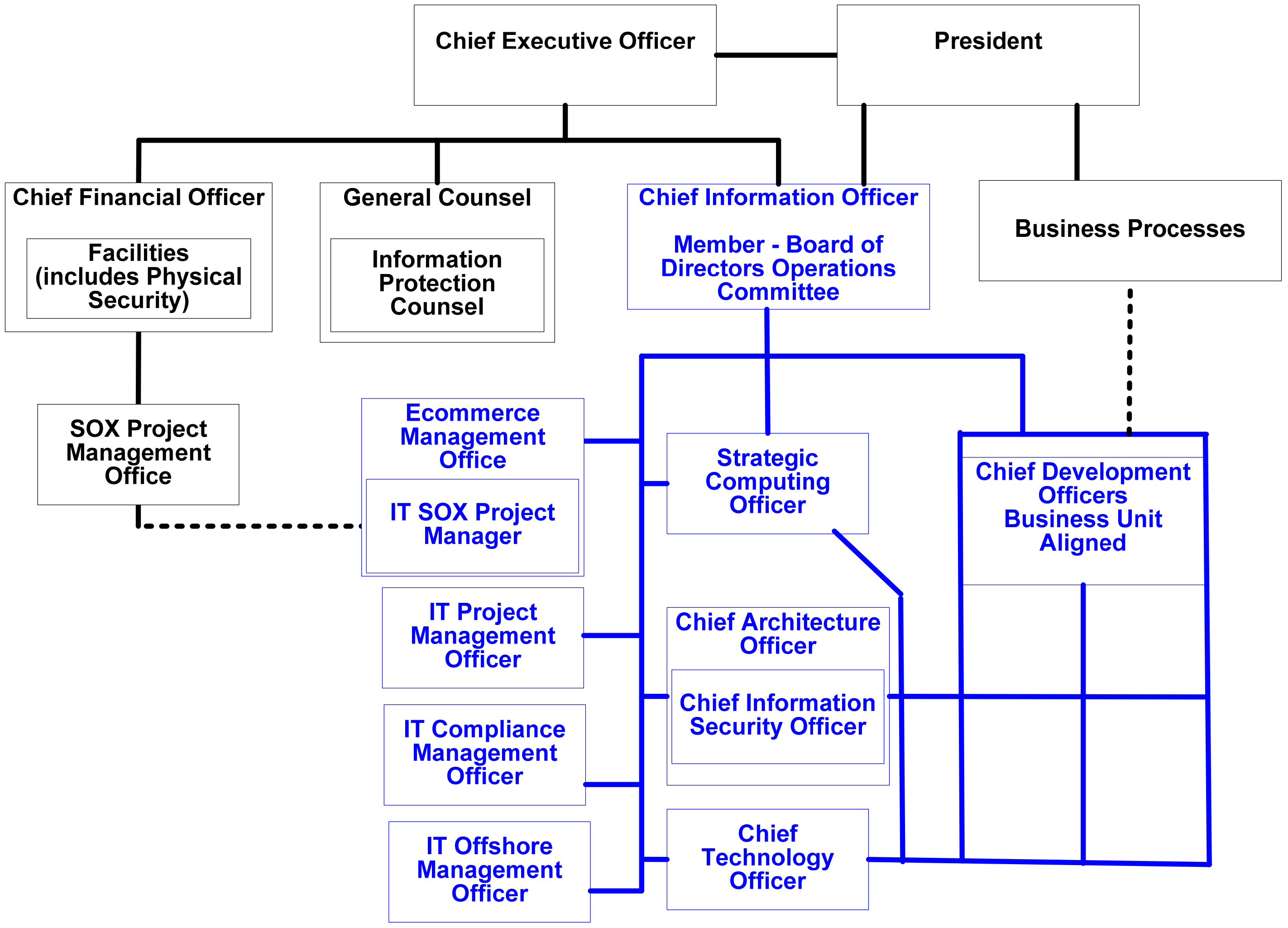
ISACA’s Common Sense

Source: IT Control Objectives for Sarbanes-Oxley
The IT Governance Institute, an ISACA Research Foundation Organization

“The SEC regulations that affect Sarbanes-Oxley are undeniably complicated, and implementation will be both time-consuming and costly. In proceeding with an IT control program, there are two important considerations that should be taken into account:

1. There is **no need to reinvent the wheel**; virtually all public companies have some semblance of IT control. While they may be informal and lacking sufficient documentation, IT controls generally exist in areas such as security and availability.
2. Many companies will be able to tailor existing IT control processes to comply with the provisions of Sarbanes-Oxley. **Frequently, it is the consistency and quality of control documentation and evidential matter that is lacking, but the general process is often in place**, only requiring some modification.**”**

BSC IT Roles and Responsibilities



Chief Executive Officer

President

Chief Financial Officer

Facilities (includes Physical Security)

General Counsel

Information Protection Counsel

Chief Information Officer

Member - Board of Directors Operations Committee

Business Processes

SOX Project Management Office

Ecommerce Management Office

IT SOX Project Manager

IT Project Management Officer

IT Compliance Management Officer

IT Offshore Management Officer

Strategic Computing Officer

Chief Architecture Officer

Chief Information Security Officer

Chief Technology Officer

Chief Development Officers Business Unit Aligned

Key IT SOX Roles and Responsibilities

- SOX IT Liaison
- SOX IT Committee
  - SOX IT Liaison (committee chair)
  - Internal Audit’s IT Division
  - Information Security Group
  - IT Compliance Management Office
- IT Assessors – Accountable Directors
- IT Reviewers – CXOs or Direct Reports

Standard Consultant Recommendation

1. Determine the scope of your SOX effort
2. Evaluate current control structure with respect to systems in scope
3. Develop action plan to mitigate identified gaps
4. Implement required controls and update documentation
5. Validate and certify controls

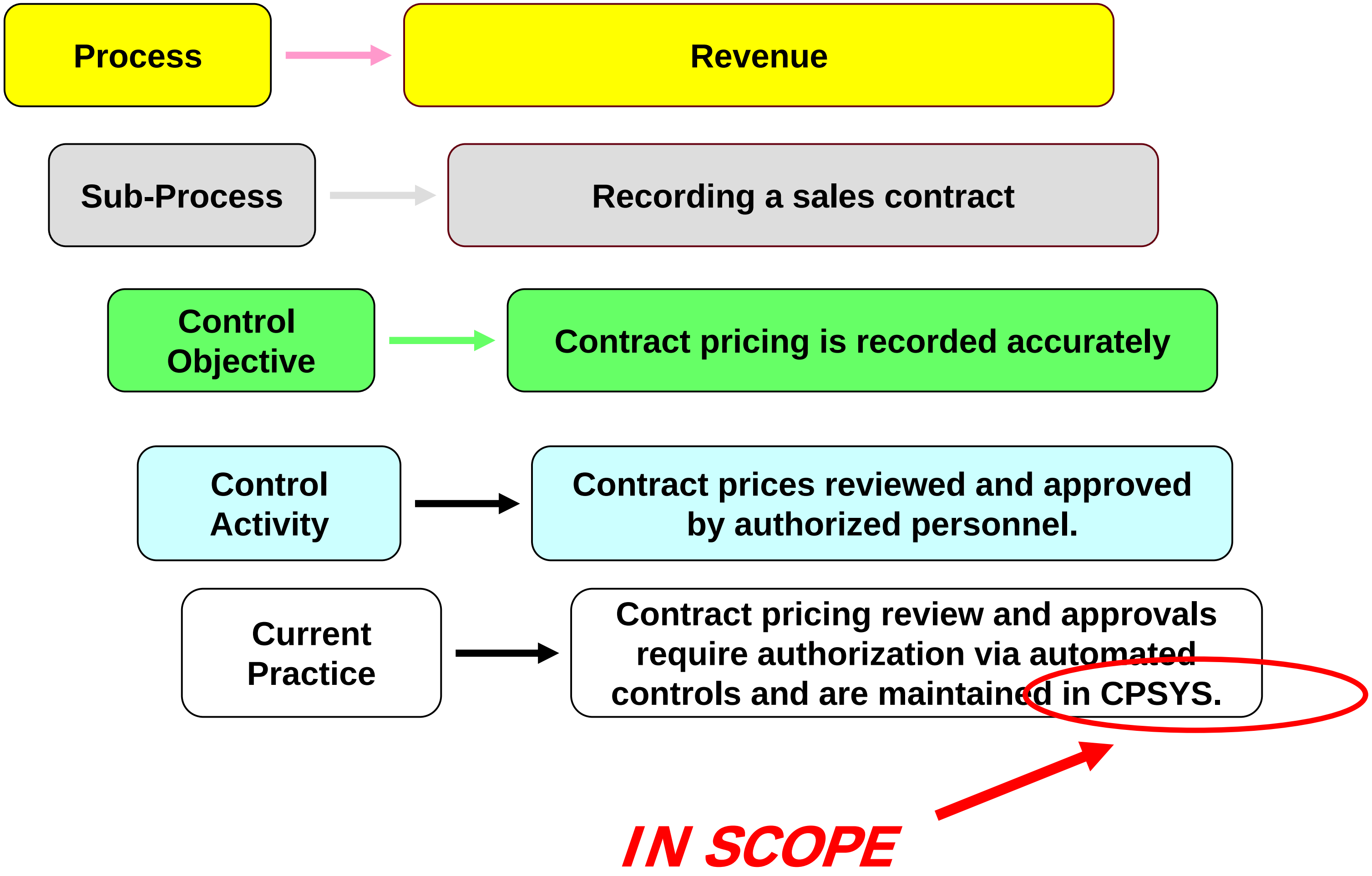
Step 1: Determine the scope of your SOX Effort

- ***Start with the business control structure and processes for financial reporting***
- ***Reduce the processes to a set of procedures***
- ***Identify the control objectives that are supported by those procedures***
- ***Identify the applications as known to the business to support their controls***

This is done by the SOX PMO. As we follow this process, the IT Liaison compiles:

a list of applications ⇨

Example: Determining the scope of SOX Effort



Process → Revenue

Sub-Process → Recording a sales contract

Control Objective → Contract pricing is recorded accurately

Control Activity → Contract prices reviewed and approved by authorized personnel.

Current Practice → Contract pricing review and approvals require authorization via automated controls and are maintained in CPSYS.

IN SCOPE

Step 2. Evaluate control structure with respect to scope

Start with the list of applications

- ***Identify IT control objectives common to all applications with reference to current Policies and Procedures***
- ***Review Control Objectives with Internal and External audit***
- ***Identify the control practices for each application with reference to Control Objectives***
- ***Collect documentation on control practices that are common to all applications, these are General Controls***
- ***Collect documentation on control practices common to applications of common architecture, these are Application Controls***

As this step was completed, we compiled:

a list of control objectives and associated control practices ⇨

Example: Control structure with respect to scope

GENERAL CONTROLS

Application: CPSYS (Contract Pricing System)
IT Governor: Jeannette Santos, Senior Managing Director, IT Pricing Development
IT Manager: Carol Godwin, Vice President, IT Pricing Development
Change Control Administrator: Kristin Klark, Associate Director, IT Quality Assurance
Recovery Administrator: Josh Smith, Associate Director, IT Operations
Description: CPSYS allows sales to enter proposed and change pricing for contract printing and contract negotiation. Once contracts are signed, legal uses CPSYS to compare to the signed contract and accepts as revenue.
Application Component list:
Component Name: GUI (various applications)
Platform: Motif/X-Windows/accessed through Hummingbird Exceed on Wintel
Specifics: Startup executables on network file share //ntshare/cpsys
Support Team: IT Wintel Administration
Component Name: Database
Platform: Sybase DBMS
Specifics: Sybase ASE server CPSYSDB1 on Sun Solaris machine cpsyssol1
Support Team: IT UNIX and Sybase Administration
Change Control Overview: Developers use Clearcase for source code versioning. QA compiles and delivers to IT Wintel and/or UNIX Administration with corresponding install instruction.
Source Code Repository: Clearcase on ccserver1
Access Control Overview: Users login to the X-Windows GUI via single-sign-on, it retrieves the Sybase password which is unknown to the user. Entitlements are stored in Sybase. Certain business users can add or remove SSO users from the application and also change their roles and privileges.
Network Access Category: Internal
Primary Password Repository: Single-Sign-On Secondary Repository: Sybase
User Admin Team: Access Admin User Admin Team: Sybase Admin
Entitlement Repository: Sybase User Admin Team: Business users under Sam Jones

APPLICATION CONTROLS

Step 3: Develop action plan to mitigate gaps

Start with the list of control objectives and documentation on associated practices.

⇨ **Identify any application that does not meet control objectives, that is, documentation on corresponding practice is missing or inadequate to cover control objective.**

⇨ **Notify CXOs of deficient applications that they must change current practice and update documentation.**

⇨ **Identify metrics that show progress in gap mitigation.**

⇨ **Review planned practices and implementation timeframe to ensure they are compliant.**

When this step was completed, we had:

actionable plans and visible metrics ⇨

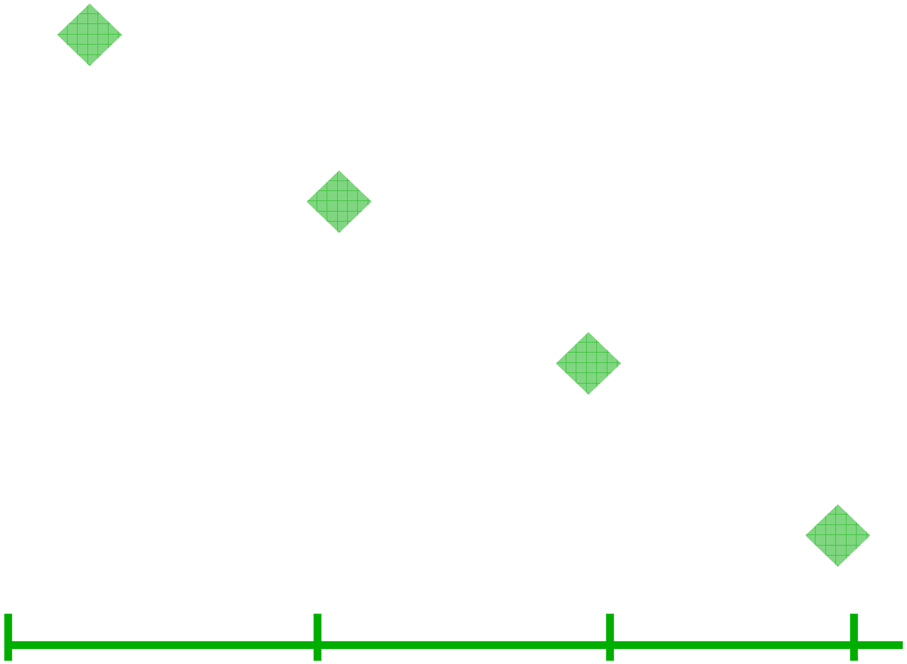
Example: Develop action plan to mitigate gaps

Identify any application that does not meet control objectives, that is, practices are missing or inadequate.

Notify CXOs of deficient applications that they must change current practice.

Identify metrics that show progress in gap mitigation.

Review planned practices and implementation timeframe to ensure they are compliant.



Enough time to schedule communication with Senior Managers

Enough time for a development lifecycle

The day external audit needs to start testing to assess SOX Compliance

Example SOX IT Committee Lists

Control Objective	*General*	*Control Practice*
Logical security tools and techniques are implemented, configured, and administered to enable restriction of access to data and programs.	***Network***	***Firewalls restrict traffic into the Internal Network from all external sources to application that require strong authentication.***

Control Objective	*Application*	*Control Practice*
Logical security tools and techniques are implemented, configured, and administered to enable restriction of access to data and programs.	***Client/Server*** ***(CPSYS, CSAPP2, etc)***	***Strong authentication is provided via Single-Sign-On. OS and DBMS Security configured at group level. Entitlements configured via BU-administered screen that updates DB2 table.***

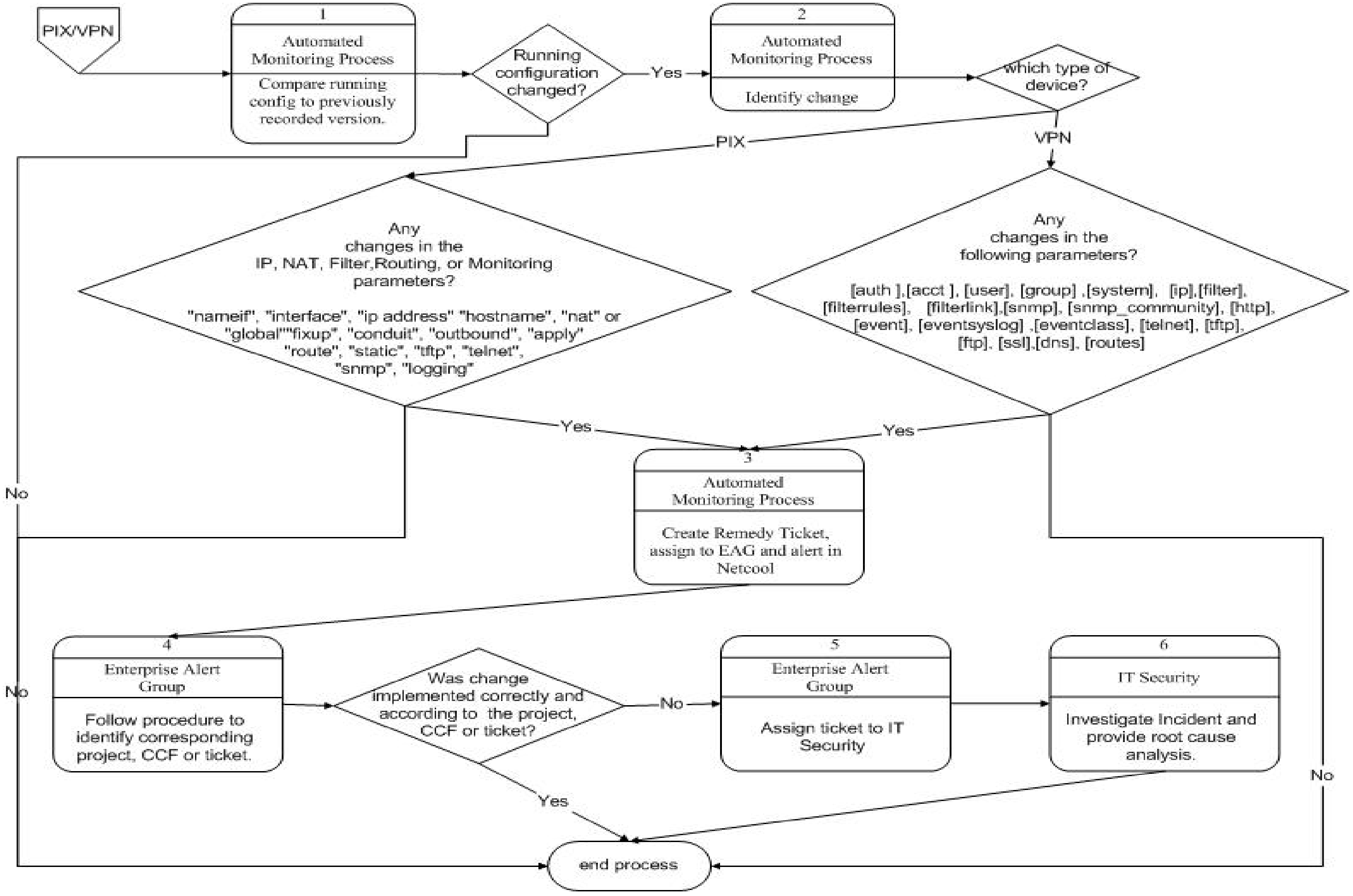
Step 4: Implement Required Controls, Update Documentation

- ⇨ ***Start with the actionable plans for gap mitigation.***
- ⇨ ***Publish metrics.***
- ⇨ ***Identify Documentation.***

When this step is completed, we have: ⇨

documentation and awareness

Example CXO Documentation – Control Practice Description



PIX/VPN

1
Automated Monitoring Process
Compare running config to previously recorded version.

Running configuration changed?

2
Automated Monitoring Process
Identify change

which type of device?

Any changes in the IP, NAT, Filter,Routing, or Monitoring parameters?

"nameif", "interface", "ip address" "hostname", "nat" or "global""fixup", "conduit", "outbound", "apply" "route", "static", "tftp", "telnet", "snmp", "logging"

Any changes in the following parameters?

[auth],[acct], [user], [group] ,[system], [ip],[filter], [filterrules], [filterlink],[snmp], [snmp_community], [http], [event], [eventsyslog] ,[eventclass], [telnet], [tftp], [ftp], [ssl],[dns], [routes]

3
Automated Monitoring Process
Create Remedy Ticket, assign to EAG and alert in Netcool

4
Enterprise Alert Group
Follow procedure to identify corresponding project, CCF or ticket.

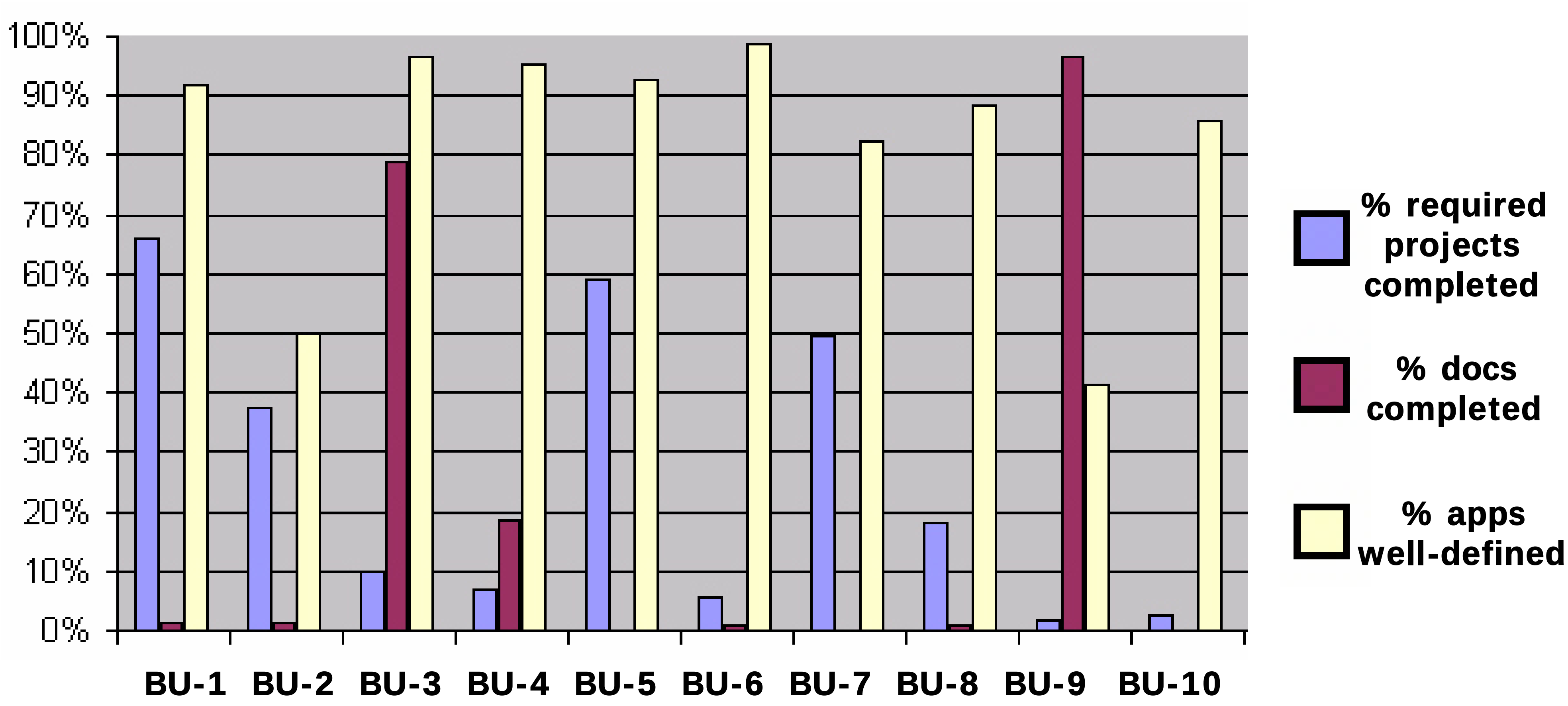
Was change implemented correctly and according to the project, CCF or ticket?

5
Enterprise Alert Group
Assign ticket to IT Security

6
IT Security
Investigate Incident and provide root cause analysis.

end process

Example Compliance Metrics



Step 5: Validate and certify controls

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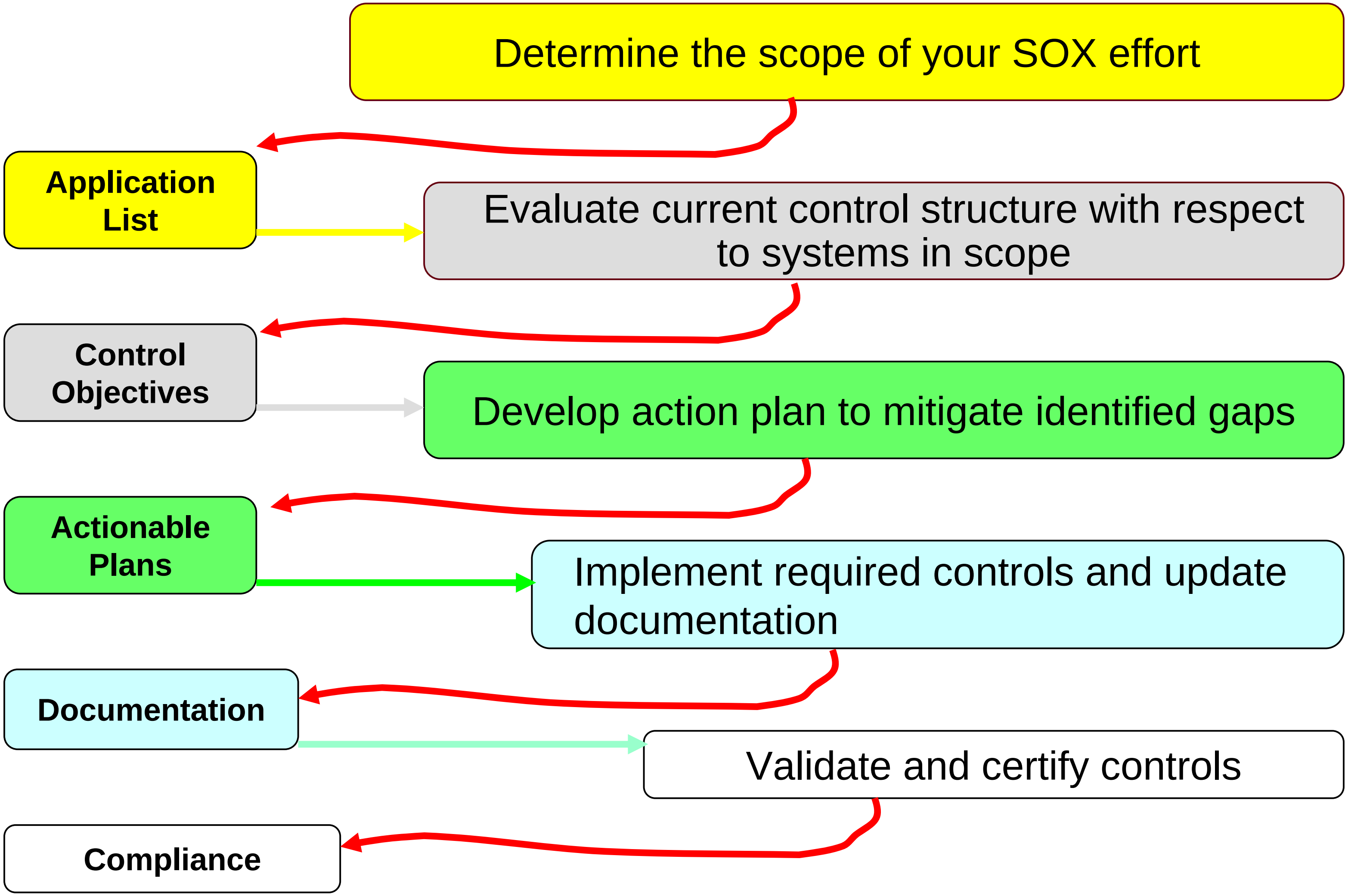
- ⇨ ***Start with the documentation on control objectives as well as the documentation on the servers and software that comprise the applications and all associated control practices.***
- ⇨ ***Test all general controls.***
- ⇨ ***Test all the control practices associated with each application infrastructure type to ensure that they exist and are consistently implemented.***
- ⇨ ***Do this periodically and document test results.***

When this step is completed, you have:

- ***compliance***

Putting it all together



Determine the scope of your SOX effort

Application List

Evaluate current control structure with respect to systems in scope

Control Objectives

Develop action plan to mitigate identified gaps

Actionable Plans

Implement required controls and update documentation

Documentation

Validate and certify controls

Compliance

For more information….

Useful sites:

www.pcaobus.org

www.sec.gov/spotlight/sarbanes-oxley.htm

www.coso.org

www.isaca.org

www.ffiec.gov