Title: UCF IT Problem Management Policy & Procedure	Effective: 05/11/2018
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Approved By: Matthew Hall, VP of IT and CIO	Page 1 of 11

Revision History			
Revision (Rev)	**Date of Rev**	**Owner**	**Summary of Changes**
Section I; Updated title & body	10/31/2018	Scott Baron	Updated title and paragraph body verbiage
Section VII. Step 5	03/18/2019	Scott Baron	Included verbiage around vendor changes
Section III.	03/18/2019	Scott Baron	Revised UCF IT members
All sections requiring updates	01/27/2022	Scott Baron	Pertinent updates required to bring doc current; Major Incident in scope (Statuspage) with updates to Visio's

I.   DOCUMENT CONTROL AND APPROVALS

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II.   OBJECTIVES

This document is intended to define and describe a consistent Problem Management process that aims to improve UCF IT service quality by providing an approach to investigate, analyze, document and remove causes of incidents that occur in UCF IT production systems.

The objectives of the UCF IT Problem Management process are to:

- Diagnose the root cause of incidents and determine the permanent solution to those problems to prevent recurrence
- Maintain information about problems, appropriate workarounds and resolutions to reduce the number and impact of incidents over time
- Conduct problem reviews to determine what could be done better in the future
- Proactively identify and solve problems to improve IT service quality and prevent potential incidents from occurring

III. **DEFINITIONS**

Problem Management: Process that investigates the cause of incidents and, wherever possible, implements a permanent solution to prevent recurrence. Until a permanent resolution is applied, the process will attempt to provide a workaround to enable the service to be restored and the incident(s) to be resolved

Problem: A cause of one or more incidents. The cause is not usually known at the time a problem record is created, and the Problem Management process is responsible for further investigation

Reactive Problem Management: Resolving problems in response to one or more active (opened) incidents

Proactive Problem Management: Identifying problems based on periodic scheduled reviews and an analysis of closed incident patterns

Retro Problem Record: If for any reason an Emergency change is implemented without a related ServiceNow incident record, then the accountable UCF IT department is STILL REQUIRED to create a problem record after IT services are restored. The retro problem record will ensure a root cause analysis is completed for historical reference, management review and communication (that may be required)

Incident Management: The process responsible for managing the lifecycle of all incidents. Ensures that normal service operation is restored as quickly as possible (often by means of a temporary workaround)

Incident: Implies something is broken or functioning in a degraded manner. Inquiry from a user to fix something that is broken, not working or needs repair. Also known as a break/fix issue

Workaround: A workaround is a temporary solution to restore service to normal operation while the underlying issue is being investigated. The workaround does not resolve the problem, it resolves the incident

Statuspage: External web page displaying UCF service status (https://status.ucf.edu)

Known Error: The root cause of the problem is established, and the affected configuration item (CI) is identified. <u>A temporary workaround/permanent fix may or may not exist</u>

Root Cause Analysis (RCA): The activity that identifies the root cause of a problem

Major Incident: Incident that results in significant disruption to the business and demands a response/communication beyond the routine Incident Management process. Major incidents have a separate procedure ([UCF IT Outage Communication Checklist](#)). The UCF IT services listed on [Statuspage](#) will drive the Major Incident process inclusive of Problem Management.

Problem Report: An executive summary report often used when departments inside or outside of UCF IT are requesting a summary report containing the details of the problem

Request for Change (RFC): A request for change is a submitted request within the ITSM application (ServiceNow) for a proposed change to be made to fix the problem

Information Technology Infrastructure Library (ITIL): A set of best practice publications for IT service management. Owned by the Cabinet Office (part of HM Government), ITIL gives guidance on the provision of quality IT services and the processes, functions and other capabilities needed to support them

Deferred Problem: The problem record was closed without root cause and workaround determination (e.g., costs are too high to diagnose, value to remove is too low, etc.)

IT Service Management (ITSM) application: This is the application (ServiceNow) used by UCF IT to record incidents, problems, requests and changes

IV. SCOPE OF PROBLEM MANAGEMENT

The scope of Problem Management will include diagnosis of the root cause of incidents taking the necessary action in relationship with other ITIL processes (Incident Management and Change Management) to identify errors, provide workarounds to those errors, thus being able to remove errors from UCF IT production systems.

The UCF IT Problem Management Process <u>WILL</u> cover:

- Each UCF IT department will be responsible to investigate and document justified problems by creating a problem record within the ITSM application (ServiceNow). UCF IT departments will be required to document workarounds and/or known errors as well as required to initiate the UCF IT Change Management process to fix a problem (if justified)
- Reactive Problem Management
- Proactive Problem Management
- Major Incident Process ([UCF IT Outage Communication Checklist](#))

The UCF IT Problem Management Process <u>WILL NOT</u> cover (at this time):

- The UCF IT Service Desk creating problem records on behalf of UCF IT departments
- Publishing workarounds and/or known errors from the problem record to the ServiceNow Knowledge Base
- Prioritizing or categorizing problems

V.   ROLES AND RESPONSIBILITIES

- **Problem Manager** – UCF IT department manager accountable for the problem record resolution assigned to their department (ServiceNow Assignment Group). The Problem Manager will be required to review and approve the completed root cause analysis within the problem record before the problem record can be closed.

- **Problem Owner** – The UCF IT resource responsible for creating a problem record within the ITSM application (ServiceNow) after determining an incident or trend of incidents requires a problem record. The Problem Owner responsibilities include:
  - o Record any activity performed in the problem record work notes
  - o If individuals from multiple departments are involved in researching the problem, coordinate the investigation efforts
  - o If a workaround is identified, document the workaround in the problem record and inform the user(s) affected by the incident (if appropriate)
  - o If a known error is identified, document the known error in the problem record
  - o If there is business justification for fixing the known error, initiate the UCF IT Change Management process

- **Manager of ITSM** – Accountable for the quality of the process and for the routine procedural audit.

- **UCF IT Service Desk** – Members (agents) of the tier-one UCF IT Service Desk are responsible to search for active (opened) problem workarounds and/or known errors. If the tier-one agent matches on an active (opened) problem that is related to the incident they are troubleshooting, then they are responsible to relate the incident record to the problem record.

  The tier-one agent can provide the workaround to the user if available or provide the user with available information around the known error. If there is no identified workaround and/or known error, the tier-one agent is still responsible to triage the incident over to the Problem Owner. The tier-one agents <u>should not</u> be creating any problem records. If there are no applicable opened problem records found for the incident they are troubleshooting, then the tier-one agent should triage the incident to the appropriate ServiceNow Assignment Group.

VI. POLICIES

- All problems must be recorded in ServiceNow if justified by incident assignees or UCF IT departments that deem a problem record is required
- <u>Only</u> the Problem Owner or Problem Manager can close a problem record
- If a problem will be resolved through a change, the change record must be related with the problem record
- Any work conducted for a problem, must be recorded in the work notes section of the problem record
- If an incident is related to a problem, the incident record must be related to the problem record
- Opened incident records cannot be related to closed problems

VII. LIFE CYCLE OF A PROBLEM

Steps in the UCF IT Problem Management process are:

- Reference *Figure 1.1* for the UCF IT Problem Management Life Cycle

1. **Detection and Logging**   `Detection and Logging`
   a. Reactive and Proactive Problem Management activities using Incident Management
2. **Investigation and Diagnosis**   `Investigation and Diagnosis`
   a. Analyzing the incidents (active (opened) or closed) that led to the problem. Is this a Major Incident?
3. **Identifying a Workaround**   `Identifying a Workaround`
   a. Identifying a workaround to enable the UCF IT Service Desk to address active (opened) incidents and restore normal service while the problem is being investigated
4. **Identifying a Root Cause and Raising a Known Error Record**   `Identifying Root Cause and Raising a Known-Error`
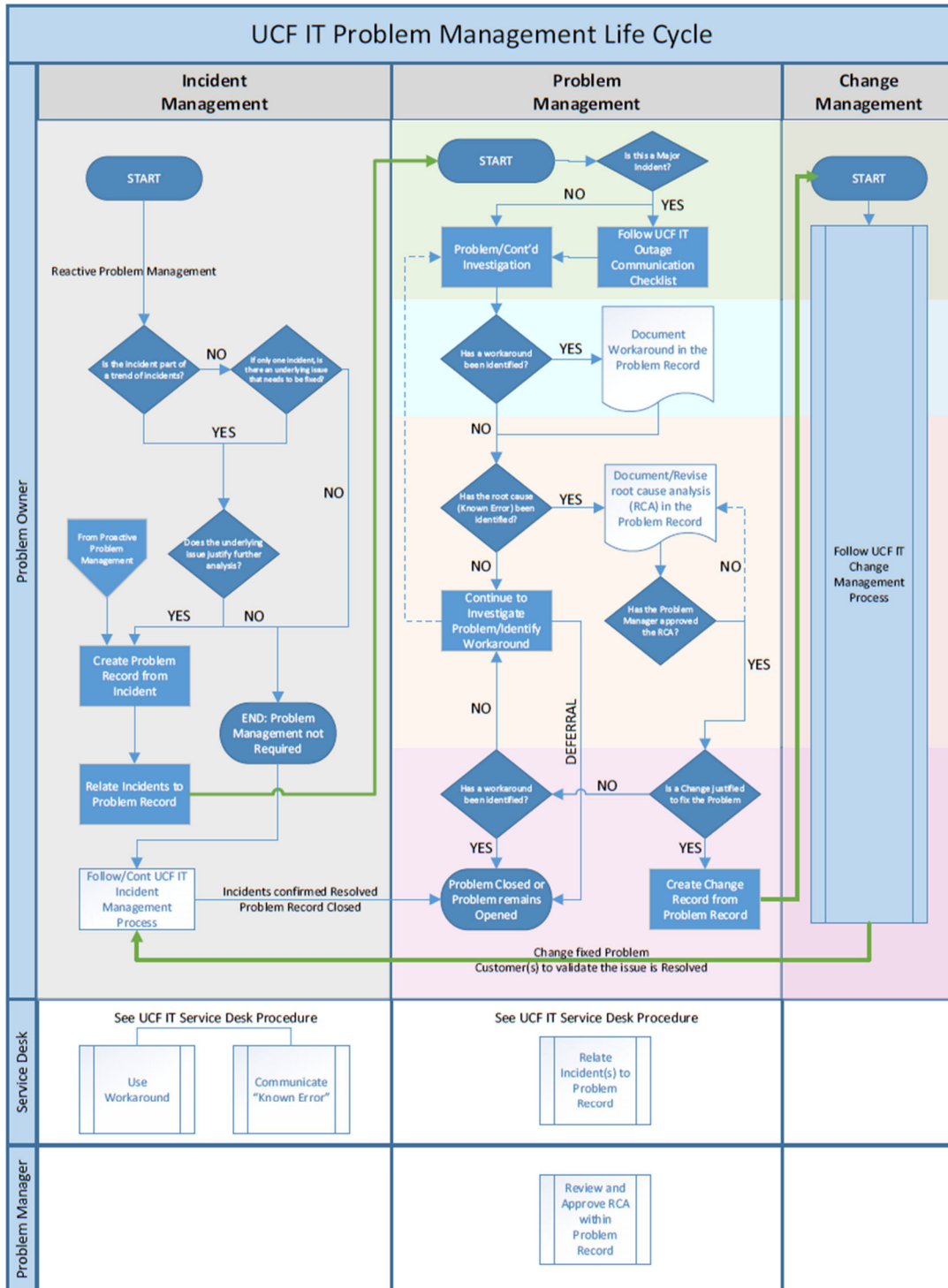   a. Identifying a root cause (known error) of the problem and raising the problem record as a known error
5. **Resolution/Closure**   `Resolution/Closure`
   a. Problem resolution resolves the underlying cause of the set of incidents and prevents those incidents from recurring. Some resolutions may require the UCF IT Change Management Process, as they may affect service levels
   b. If the fix for the problem is not justified to implement, then the <u>problem record will remain opened. The Problem Owner will continue to investigate a workaround if one was never identified</u>
   c. Problem Deferral
      i. The Problem Owner and Problem Manager can make the decision to close a problem record <u>if a workaround AND root cause cannot be identified/determined</u> (e.g. costs are too high to diagnose, value to remove is too low, etc.). Once a workaround is identified and/or known error raised, the problem record can no longer be deferred.

Figure 1.1 - UCF IT Problem Management Life Cycle

UCF IT Problem Management Life Cycle

	Incident Management	Problem Management	Change Management

Problem Owner

Incident Management:
- START
- Reactive Problem Management
- Is the incident part of a trend of incidents? — NO → If only one incident, is there an underlying issue that needs to be fixed? — NO
- YES
- From Proactive Problem Management
- Does the underlying issue justify further analysis?
- YES / NO
- Create Problem Record from Incident
- END: Problem Management not Required
- Relate Incidents to Problem Record
- Follow/Cont UCF IT Incident Management Process
- Incidents confirmed Resolved Problem Record Closed

Problem Management:
- START
- Is this a Major Incident? — NO / YES
- Follow UCF IT Outage Communication Checklist
- Problem/Cont'd Investigation
- Has a workaround been identified? — YES → Document Workaround in the Problem Record
- NO
- Has the root cause (Known Error) been identified? — YES → Document/Revise root cause analysis (RCA) in the Problem Record
- NO
- Continue to Investigate Problem/Identify Workaround
- Has the Problem Manager approved the RCA? — NO / YES
- DEFERRAL
- Has a workaround been identified? — NO → Is a Change justified to fix the Problem
- YES
- Problem Closed or Problem remains Opened
- Create Change Record from Problem Record
- Change fixed Problem Customer(s) to validate the issue is Resolved

Change Management:
- START
- Follow UCF IT Change Management Process

Service Desk
- See UCF IT Service Desk Procedure
- Use Workaround
- Communicate "Known Error"
- Relate Incident(s) to Problem Record

Problem Manager
- Review and Approve RCA within Problem Record

Legend:
- Detection and Logging
- Investigation and Diagnosis
- Identifying a Workaround
- Identifying Root Cause and Raising a Known-Error
- Resolution/Closure

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1. Detection and Logging

Detection and Logging

There are two types of activities for managing problems:
1. Reactive Problem Management
2. Proactive Problem Management

Reactive Problem Management: The assignee of one or multiple incidents is the responsible individual to determine if a problem record should be recorded within ServiceNow. Not all incidents turn into a problem. Questions the incident assignee should ask themselves before a problem record is created include:

     i.   How often are these incident(s) occurring? Is there a trend?
    ii.   Does the unknown underlying issue justify further analysis?
          a. How many people are these incident(s) affecting?
          b. What is the impact to the university if this issue continues to occur?

Post assessment and the incident assignee determines a problem record is justified; the incident assignee is to record or coordinate a problem record to be created (see the UCF IT Problem Management - Problem Record Procedure document located at "http://it.ucf.edu/policies-and-standards/it-service-management/" for step-by-step instruction on how to create a *Reactive* problem record). Additionally, if other assigned active (opened) incidents are related to the same issue, then the Problem Owner is responsible to relate those incidents to the created problem record.

NOTE: With Reactive Problem Management, a problem record will <u>ALWAYS</u> be created off an active (opened) incident. Related incidents to the problem record will always be active (opened) to start with (until a workaround is identified) in ServiceNow.

Proactive Problem Management: It is up to the discretion of each UCF IT department to create a problem record proactively. This may be from historical analyses of closed incidents (analysis of previous (closed) incidents revealed a pattern that was not apparent when each incident occurred), event logs, unreported (not a record in ServiceNow) known incident(s), or simply a brainstorming session to identify problems. Questions the UCF IT departments can answer in order to determine if a problem record justifies creation include:

     i.   How often have these incident(s) occurred? Is there a trend?
    ii.   Does the unknown underlying issue justify further analysis?
          c. How many people have these incident(s) affected?
          d. What has been the impact to the university?

Post assessment and the UCF IT department determines a problem record is justified; an individual from the UCF IT department is to create a problem record (see the UCF IT Problem Management - Problem Record Procedure document located at "http://it.ucf.edu/policies-and-standards/it-service-management/" for step-by-step instructions on how to create a *Proactive* problem record). If there are other applicable closed incidents related to the problem record created, it is up to the Problem Owner to relate those incidents.

NOTE: With Proactive Problem Management, a problem record will ALWAYS be created from scratch as a new problem record.

2. Investigation and Diagnosis Investigation and Diagnosis

The next step in the process is to investigate and diagnose the problem. Is this a Major Incident and does the UCF IT Outage Communication Checklist need to be followed? Whether a problem record was created using Reactive or Proactive Problem Management, the same process of investigation and diagnosis applies to resolve a problem. Post investigating and diagnosing the problem, the Problem Owner should have one of four outcomes.

1. Has identified a workaround WITHOUT determining the root cause
2. Has identified the root cause WITHOUT an identified workaround
3. Has identified BOTH a workaround and a root cause
4. UNABLE to identify a workaround and root cause

NOTE: It is important to allocate resources to problem investigation, because until the problem is resolved, the incident will recur, and resources will be spent on incident resolution.

3. Identifying a Workaround Identifying a Workaround

When a user encounters an incident, the first priority is to restore the impacted service so that the user can continue working. Therefore, the priority of the Problem Management process is to provide a workaround to the impacted user(s). The workaround DOES NOT fix the underlying problem, but it allows the customer to continue working by providing an alternative mean of achieving the same result.

If a workaround is identified, the Problem Owner is required to document the workaround in the problem record. Even though a permanent solution has not been determined at this point, the documented workaround will allow the UCF IT Service Desk tier-one agents to assist and resolve user contacts if they are related to an active (opened) problem (See *Figure 1.2* in Appendix A: for the complete UCF IT Service Desk Procedure).

NOTE: <u>UCF IT or the university may decide to continue to use the workaround and suspend or not even pursue work on a permanent solution if one is not justified</u>.

4. **Identifying a Root Cause and Raising a Known Error Record**   Identifying Root Cause and Raising a Known-Error

Whether a workaround can or cannot by identified, the Problem Owner's objective is to resolve the problem (if justified). Before a problem can be resolved, the root cause of the problem must be known. The Problem Owner is the responsible individual to investigate the problem and attempt to uncover the root cause.

If the root cause is identified, the Problem Owner is to complete a root cause analysis (RCA) within the problem record. The Problem Manager is then required to review and approve the RCA documentation before the problem record can be raised as a known error.

Raising a known error within ServiceNow not only reflects a root cause being identified, but a raised known error also allows the UCF IT Service Desk tier-one agents to manage incident troubleshooting. This process helps assist user contacts that are related to existing problem records (See *Figure 1.2* in Appendix A: for the complete UCF IT Service Desk Procedure). By searching and matching on a known error, the tier-one agents can relay information to the user concerning if a change is planned to fix the incident or if additional investigation is being conducted with no estimated time to incident resolution.

NOTE: In some cases, a workaround is available although the root cause is not yet known. In other cases, the Problem Owner may know the root cause, but not have a workaround because a change has to be implemented to fix the fault.

If the Problem Owner is unable to determine the root cause, the problem record will stay active (opened) and the Problem Owner will continue to investigate until uncovering the unknown underlying issue.

5. **Problem Resolution/Closure**   Resolution/Closure

When the Problem Owner has identified the root cause and a solution to the problem, then if justified, the solution should be implemented to resolve the underlying fault and thus prevent any further incidents from disrupting the service. Implementing the resolution may involve a degree of risk; therefore, for a problem to be resolved, the problem <u>IS REQUIRED</u> to go through the UCF IT Change Management Process. Depending on the risk/impact identified, the change to fix the problem can be implemented as a Standard or Normal change.

The problem resolution may also be dependent on a vendor. In this type of scenario, the Problem Owner should coordinate with the vendor to ensure a successful change is implemented.

Following the successful change (Standard, Vendor or Normal) implementation, any active (opened) incidents caused by the problem should be verified by the incident assignee that they have been resolved and then can be closed. Once all related active (opened) incidents are in a state of resolved, the problem record can be closed.

If for any reason, the solution to the problem is not justified to implement or the cost outweighs the value in continuing to identify a workaround/root cause, then the problem record will take one of three paths.

1. The problem record will remain opened with the workaround identified
2. If the workaround was never identified, the problem record will remain opened while the Problem Owner continues to identify a workaround
3. The Problem Owner and Problem Manager make the decision to close the problem record (deferral) due to the costs outweighing the value of continuing the effort to identify a workaround AND root cause

If requested, the Problem Owner should provide a Problem Report to the requestor. Reference the UCF IT Problem Management - Problem Record Procedure document located at "http://it.ucf.edu/policies-and-standards/it-service-management/" for step-by-step instructions on how to generate this report within ServiceNow.

VIII. EMERGENCY CHANGE - RETRO PROBLEM RECORD

There may be occasions when the UCF IT Problem Management process cannot be followed in its entirety/order due to Emergency changes that must to be introduced as soon as possible to restore services. If an Emergency change is not implemented as soon as possible, the identified issue could create significant risk to the university.

If for any reason an Emergency change is implemented without a related ServiceNow incident record, then the accountable UCF IT department is STILL REQUIRED to create a problem record after IT services are restored. This is known as a retro problem record (see the UCF IT Problem Management - Problem Record Procedure document located at "http://it.ucf.edu/policies-and-standards/it-service-management/" for step-by-step instruction on how to create a *Retro* problem record).

The retro problem record will ensure a root cause analysis (RCA) is completed for historical reference, management review and communication (that may be required). The

Problem Owner is still responsible to relate the problem record to the Emergency change record.

IX. ADDITIONAL CONSIDERATIONS

All existing and new staff members of IT are expected to be familiar with the intent and the contents of the UCF IT Problem Management Policy and Procedure.

X. APPENDIX

Appendix A: UCF IT Service Desk Procedure

Figure 1.2 – UCF IT Service Desk Procedure