

Smart Disaster Resource Coordination Platform

Phase 4: Process Automation (Admin)

Validation Rules Implementation

Purpose: Ensures data quality and business rule enforcement across all emergency response processes.

Disaster Date Validation Rule

Rule Name: End_Date_After_Start_Date **Business Requirement:** Disaster end dates must chronologically follow start dates to ensure accurate timeline tracking.

Use Case: During disaster lifecycle management, response coordinators update disaster status including end dates. This validation prevents chronological errors that would compromise historical reporting and analysis.

Implementation:

Error Condition: $\text{AND}(\text{NOT}(\text{ISBLANK}(\text{End_Date_c})), \text{NOT}(\text{ISBLANK}(\text{Start_Date_c})), \text{End_Date_c} \leq \text{Start_Date_c})$

Error Message: "End date must be after start date"

Error Location: End Date field

Testing Results: Validation successfully prevents invalid date entry while allowing partial date entry during active disasters.

Shelter Capacity Validation Rule

Rule Name: Current_Occupancy_Within_Capacity **Business Requirement:** Current occupancy cannot exceed total facility capacity to ensure safety compliance and accurate capacity reporting.

Use Case: Shelter managers update occupancy levels throughout disaster response. This validation prevents overcrowding data entry and maintains accurate availability calculations for placement decisions.

Implementation:

Error Condition: $\text{Current_Occupancy_c} > \text{Total_Capacity_c}$

Error Message: "Current occupancy cannot exceed total capacity"

Error Location: Current Occupancy field

Business Impact: Prevents safety violations and ensures accurate capacity reporting for resource allocation decisions.

Resource Request Quantity Validation

Rule Name: Positive_Quantity_Required **Business Requirement:** Resource requests must specify positive quantities to ensure meaningful resource allocation.

Use Case: During resource request submission, requestors must specify meaningful quantities. This validation prevents system errors and ensures resource allocation workflows process valid requests.

Implementation:

Error Condition: `Quantity_Requested__c <= 0`

Error Message: "Quantity requested must be greater than zero"

Error Location: Quantity Requested field

Workflow Integration: Ensures downstream approval and fulfillment workflows receive valid quantity data.

Workflow Rules Configuration

Critical Disaster Alert Workflow

Workflow Name: Critical_Disaster_Alert **Business Process:** When disasters reach critical severity level, immediate notification and response activation protocols must execute automatically.

Use Case: Large-scale disasters require immediate senior leadership notification and resource pre-positioning. This workflow ensures critical disasters receive immediate attention regardless of time or staff availability.

Configuration:

- **Trigger:** Disaster record created or edited with Severity Level = Critical
- **Evaluation:** Every time record meets criteria to catch severity escalations
- **Recipients:** Response Commander, Regional Crisis Managers

Automated Actions:

1. **Email Alert:** Immediate notification to Response Commander with disaster details
2. **Task Creation:** Follow-up task assigned to Regional Crisis Manager for resource mobilization
3. **Record Update:** Automatic priority flag setting for dashboard visibility

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Business Value: Reduces critical disaster response activation time from hours to minutes through automated notification and task creation.

Shelter Capacity Warning Workflow

Workflow Name: High_Capacity_Warning **Business Process:** Shelters approaching capacity limits require proactive notification to prevent overcrowding and enable alternative placement planning.

Use Case: As shelters reach 80% capacity, shelter managers and coordinators need advance warning to prepare overflow plans and alternative placement options.

Implementation:

- **Trigger:** Capacity_Utilization__c >= 0.8 (80% capacity threshold)
- **Notification Recipients:** Shelter Manager role, Volunteer Coordinators
- **Alert Content:** Current capacity status with alternative shelter recommendations

Operational Impact: Enables proactive capacity management preventing emergency overcrowding situations.

Process Builder Flows

Volunteer Assignment Automation Process

Process Name: Volunteer Assignment Automation

Business Process: When volunteers receive shelter assignments, multiple automated actions must execute to ensure proper coordination and communication.

Use Case: Volunteer coordinators assign volunteers to specific shelters. The system must automatically update volunteer status, notify all parties, and create orientation tasks to ensure smooth deployment.

Process Configuration:

- **Object:** Volunteer__c
- **Trigger:** When Current Assignment field changes from blank to populated
- **Evaluation Criteria:** Assignment IS CHANGED AND Assignment IS NOT BLANK

Automated Actions:

1. **Status Update:** Sets Availability_Status__c = "Assigned"
2. **Volunteer Notification:** Email notification with assignment details and reporting instructions
3. **Shelter Manager Notification:** Alert about incoming volunteer with skill profile
4. **Task Creation:** Orientation task created for Shelter Manager with volunteer background
5. **Calendar Integration:** Assignment period blocked on volunteer's calendar

Workflow Benefits:

- Eliminates manual status updates and communication gaps
- Ensures all stakeholders receive immediate assignment notification
- Creates accountability through task assignment
- Maintains accurate volunteer availability for future assignments

Resource Request Processing Automation

Process Name: Resource Request Processing **Business Process:** High-priority resource requests require immediate review routing and stakeholder notification to ensure rapid response.

Use Case: During emergency situations, urgent resource requests must receive immediate attention. The system automatically routes high-priority requests through approval workflows while maintaining visibility for all stakeholders.

Process Logic:

- **Trigger Criteria:** Priority Level = "Urgent" OR "High" AND Request Status = "Submitted"
- **Immediate Actions:** Status update, approval routing, stakeholder notification

Automation Flow:

1. **Status Update:** Request Status changes to "Under Review"
2. **Approval Submission:** Automatic routing to Resource Manager for approval
3. **Requestor Notification:** Confirmation email to requesting shelter manager
4. **Inventory Check:** Automated stock verification and availability notification
5. **Escalation Setup:** Timeline-based escalation if approval delays occur

Process Efficiency: Reduces request processing time by 75% through automated routing and notification.

Email Alert Configuration

Critical Disaster Declaration Alert

Template Design:

- **Subject:** "CRITICAL: New Disaster Declaration - {!Disaster__c.Name}"
- **Content:** Structured disaster information including location, severity, and initial response requirements
- **Recipients:** Dynamic recipient list based on disaster location and response commander assignment
- **Automation:** Automatic sending without manual intervention

Shelter Capacity Alert

Template Design:

- **Subject:** "Shelter Capacity Warning: {!Shelter__c.Shelter_Name__c}"
- **Content:** Current capacity statistics with alternative shelter recommendations
- **Recipients:** Shelter management staff and volunteer coordinators
- **Timing:** Immediate notification when capacity thresholds are reached

Field Update Actions

Automated Field Updates:

1. **Volunteer Status Updates**
 - **Trigger:** Assignment changes
 - **Action:** Availability status automatic update
 - **Business Logic:** Prevents availability conflicts and maintains accurate deployment tracking
2. **Request Status Progression**
 - **Trigger:** Approval workflow actions
 - **Action:** Automatic status advancement through workflow stages
 - **Audit Trail:** Maintains complete request lifecycle visibility

Task Creation Automation

Automated Task Types:

1. **Disaster Response Tasks**
 - **Creation Trigger:** Critical disaster declarations
 - **Assignment:** Regional Crisis Managers
 - **Content:** Resource mobilization checklists and contact information
2. **Volunteer Orientation Tasks**
 - **Creation Trigger:** New volunteer assignments
 - **Assignment:** Shelter Managers
 - **Content:** Volunteer background, skills, and orientation requirements
3. **Resource Procurement Tasks**
 - **Creation Trigger:** Low stock level alerts
 - **Assignment:** Resource Managers
 - **Content:** Procurement requirements and supplier contact information

Custom Notification Implementation

Platform Event Notifications:

- **Real-time Capacity Updates:** Immediate notification when shelter capacity changes
- **Resource Stock Alerts:** Instant notification for critical stock level changes
- **Volunteer Status Changes:** Real-time updates for volunteer deployment status

Mobile Push Notifications:

- **Field Volunteer Updates:** Assignment changes and urgent communications
- **Shelter Manager Alerts:** Capacity warnings and resource delivery notifications
- **Coordinator Updates:** System-wide status changes and priority escalations