

# Stakeholder Responsibilities Related to SEDM & Remote Monitoring

State Implementing Agencies, Consultant, Empanelled Agencies

- **Concept & Objectives of SEDM (Solar Energy Data Management) Platform**
- **Architecture of SEDM Platform**
- **SEDM Platform Components**
- **State wise Status of SEDM Platform**
- **SEDM Activities and Responsibilities : Till Go Live of Platform**
- **SEDM Activities and Responsibilities : Scheme Implementation Phase**
- **SEDM Activities and Responsibilities : Operational Data Integration (RMS & SCADA Integration) -**

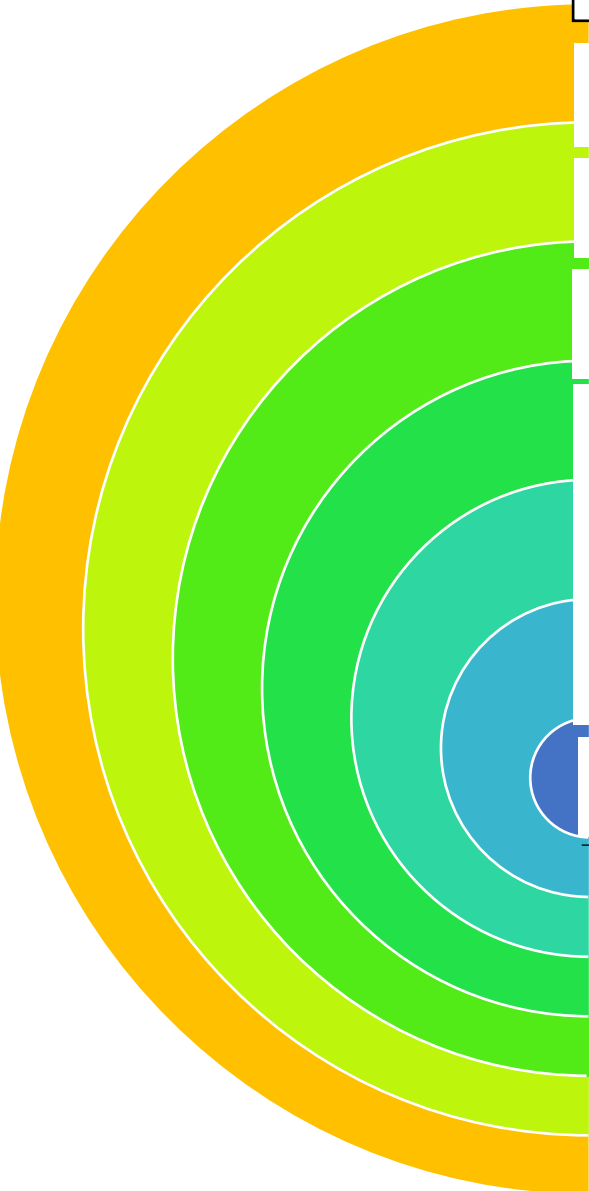
# One Nation - One Solar Energy Data Management (SEDM) Platform for PM-KUSUM

**National Level  
SEDM Platform**  
(Solar Energy Data  
Management Platform)  
**Vision**



# National Level SEDM Platform (Solar Energy Data Management Platform)

## Objectives



SEDM Module	Objective	Parameters and Stake Holders
Consumer Management	Beneficiary Tracking	<ul style="list-style-type: none"> <li>• Identification, Location-Agriculture-Irrigation-Pump-Solar-Finance Details</li> <li>• SIA, MNRE</li> </ul>
	Scheme Progress Management	<ul style="list-style-type: none"> <li>• Application Status Updates, MIS Reports &amp; Dash board for Progress Tracking</li> <li>• SIA, MNRE</li> </ul>
Asset Management	Asset Quality Management	<ul style="list-style-type: none"> <li>• Registration, Pre Dispatch Inspection &amp; Site Inspection, Asset Mapping &amp; Tracking, Insurance</li> <li>• Farmer, SIA, Empanelled Agency, Insurance Agencies</li> </ul>
	Energy Transactions	<ul style="list-style-type: none"> <li>• Generation, Consumption, Import, Export, Net</li> <li>• Farmer, DISCOM, SIA</li> </ul>
Performance Analysis	Performance Analysis	<ul style="list-style-type: none"> <li>• %CUF, Water Flow Rate, AC/DC Efficiency, % Data Availability</li> <li>• Farmer, Empanelled Agency, SIA, MNRE</li> </ul>
	Irrigation Analysis	<ul style="list-style-type: none"> <li>• Pump Running Hours, Water Discharge/Usage Vs. Area/Season/Crop</li> <li>• SIA, MNRE, Research Institute</li> </ul>
Live Asset Monitoring	Live Operational Status	<ul style="list-style-type: none"> <li>• Geo Location, Pump Status, Controller / Inverter Status, Grid Status</li> <li>• Farmer, Empanelled Agency, DISCOM, MNRE</li> </ul>

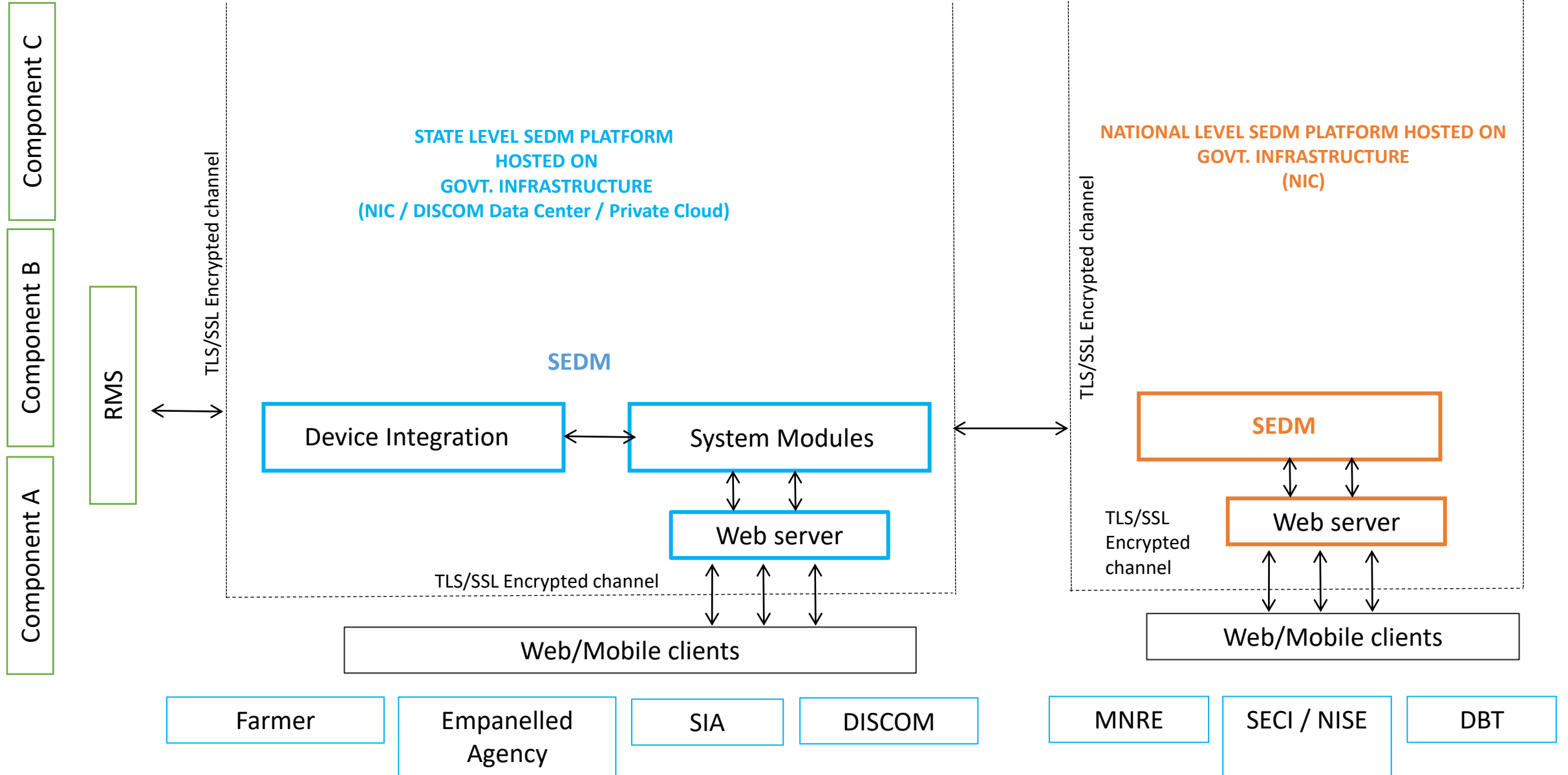
**Details**

# High Level System Architecture

Scalability to Manage Thousands of Systems

Security using TLS/SSL VPN

Data Integrity by Hosting on Govt. Infrastructure





# SEDM Platform

*Under PM-KUSUM MNRE has conceptualized One National One Solar Energy Data Management (SEDM) Platform at state as well as National Level for all stakeholders. It Comprises of*

1

System Related Software Modules (IT)

Uniform for all 3 components, Irrespective of number of systems deployed

2

RMS Integration related software Modules - SCADA (OT)

Variable and scalable depending on number of solar systems implemented

3

IT Server Infrastructure Requirement for Part 1 & 2

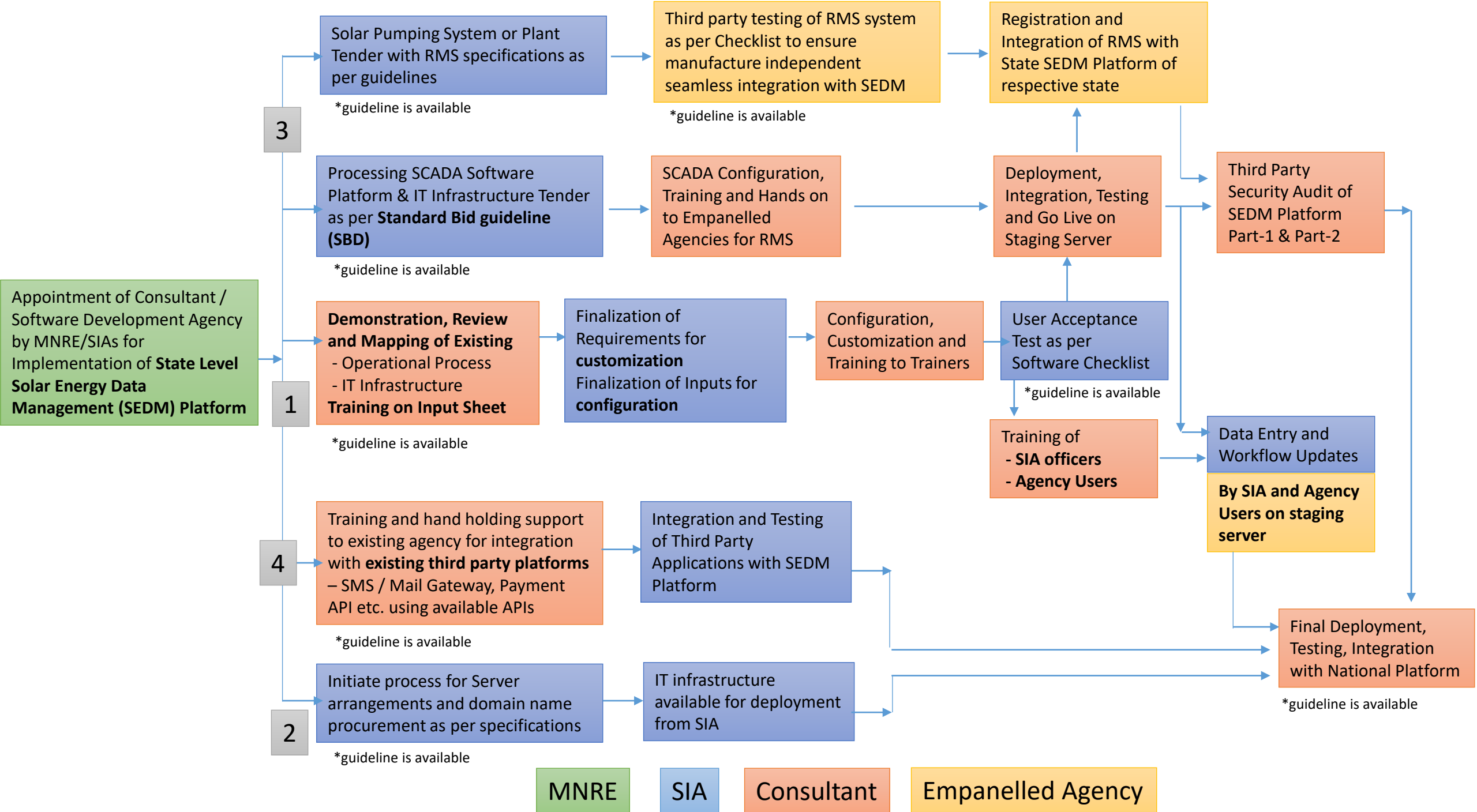
Variable and scalable depending on number of solar systems implemented

	State (at least one component)	State Level Implementation			National Level Integration	
		Part-1 – Business Process	Part-2 RMS	Part-3 IT Infrastructure	Part-1 Business Process	Part-2 RMS
1	Haryana	Y	Y	Y	Y	Y
2	Gujarat	Y	Y	Y	Y	Y
3	Punjab	Y	Y	Y	Y	Y
4	Tripura	Y	Y	Y	Y	Y
5	Jharkhand	Y	Y	Y	Y	Y
6	Kerala	Y	Y	Y	Y	Y
7	Uttar Pradesh	Y	Y	Y	Y	Y
8	J&K	Y	Y	Y	Y	Y
9	Maharashtra	Y	Y	Y	Y	
10	Arunachal Pradesh	Y	Y	Pending for RMS	Y	End of September
11	Nagaland	Y	Y	Pending for RMS	Y	End of September
12	Manipur	Y	Y	Pending for RMS	Y	End of September
13	Meghalay	Y	Y	Pending for RMS	Y	End of September
14	Uttarakhand	Y	Y	Pending for RMS	Y	End of September
15	Rajasthan	Y	End of September	End of September	End of September	End of September
16	Madhya Pradesh	Y		Pending for RMS	Y	

	State (at least one component)	State Level Implementation			National Level Integration	
		Part-1 – Business Process	Part-2 RMS	Part-3 IT Infrastructure	Part-1 Business Process	Part-2 RMS
<b>17</b>	Telangana	Y				
<b>18</b>	Odisha	Y				
<b>19</b>	Karnataka	Y				
<b>20</b>	West Bengal					
<b>21</b>	Assam					

# SEDM Activities and Responsibilities – Till Go Live of Platform





# SEDM Activities & Responsibilities : Scheme Implementation (IT)



## **CURRENT ISSUES IN SCHEME IMPLEMENTATION DATA**

### **Application Registration Data :**

In valid entries or Blank entries of various fields such as Mobile Number, Village, Area, Gender, Aadhaar Auth Status

### **Commercial Data :**

In valid entries or Blank entries of various fields such as System Price, CFA Value, SFA Value, Beneficiary Contribution

### **Post Sales Service Data :**

In valid entries or Blank entries of various fields such as Service Center details, Warranty and Insurance Details

### **Asset Data :**

In valid entries or Blank entries of various fields such as Make, Ratings, Qty, Model No, Serial Number etc.

### **Project Time Line Data :**

In valid entries or Blank entries or same user and date of all Status

## **SOLUTION**

**1. Automatic Data Processing Logic Implementation**

**2. Verification and Approval at important stages by SIA**

# PART-1 One Time Registration Details

## Data Entry, Verification and Approval of Registration Data by SIA

### **System Registration :**

System Type (AC/DC), Sub Type (Surface/Submersible), Ratings (3 HP/5 HP/7.5 HP etc.), Rate, Contribution (MNRE-CFA, State-SFA, Farmer)

### **System Capacity Ratings wise Empanelled Agency Registration**

### **Product Registration**

Component (Solar Panel / Inverter / Pump Controller etc.) : Make, Model No., Technical Specifications, Check List

### **Test Certificate Upload**

### **Empanelled Agency Service Center Registration**

District wise Service Center Details, Contact Address, Contact Person, Contact details

**Above Details will be sync to National Platform as well as Mobile Application once verified and Approved by SIA**

## **PART-2 Application Registration Details**

**Data Entry by Farmer or Empanelled Agency. Verification by Empanelled Agency. Approval by SIA**

**Application Registration** : Farmer / Empanelled Agency

**Document Submission** : Farmer / Empanelled Agency

**Site Survey** : Empanelled Agency / SIA

### **Verification and Approval by SIA**

**Site Survey Acceptance** : SIA

**Application Accept / Reject** : SIA

**Notice to Proceed** : SIA

**Application Status update on State SEDM Portal as well as Mobile Application once verified and Approved by SIA**

## **PART-3 Quality Management and Tracking Details**

### **Data Entry, Verification by Empanelled Agency**

Lot Creation with Component wise serial numbers (serial number creation and acceptance against Test Certificate)

Asset Serial Number Mapping against Individual Farmer (selection of serial numbers only from approved Lot)

IMEI Mapping Against Individual Farmer for RMS Data

Installation Commissioning Status and Image Upload

### **Inspection and Approval by SIA**

Lot Approval for Dispatch

Site Inspection

Auto Generation and Submission of JCR – Joint Commissioning Report

**Above Details will be sync to National Platform as well as Mobile Application once verified and Approved by SIA**

# SEDM Activities and Responsibilities : RMS & SCADA Integration (OT)



- **Objective : To monitor, track and improve Utilization of Deployed Assets**
- **Asset Tracking :**
  - Location and Status of Asset
- **Asset Usage Analysis**
  - Water discharge
  - Pump Usage Pattern
- **Asset Performance Analysis**
  - Energy Generation
  - Capacity Utilization Factor
- **Improvement in Quality of Supply & Services**

# Farmer Details : Shri Pal Singh

Application / Saral No	SWPS/2020/01455
Pump Details	7.5 HP AC Submersible
Land Coverage Area	4 Acres
Town	Sultanpur
District	Gurugram
State	Haryana

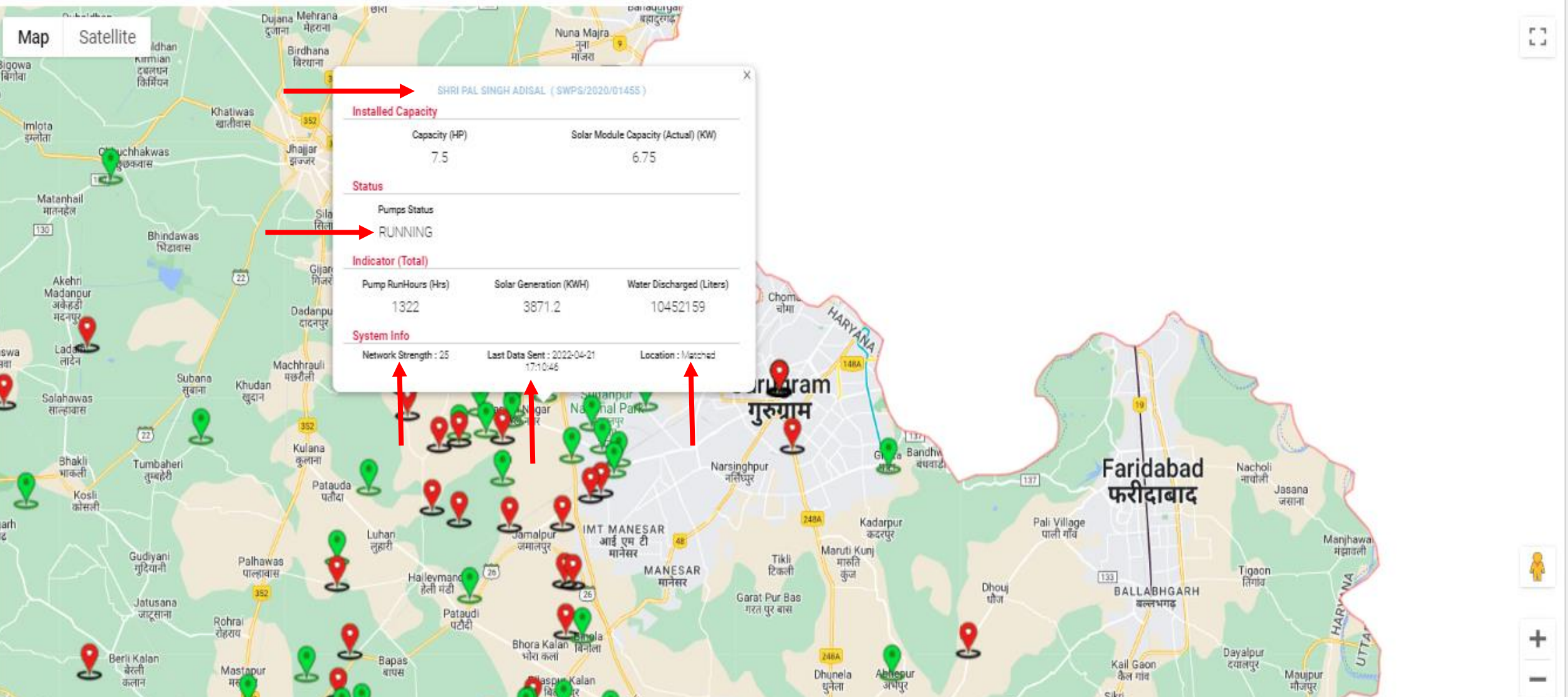
# Location & Status Tracking – 21<sup>st</sup> April, 2022 – 17:10



English

Home Consumer Scheme Progress Asset **Live Monitoring** Performance Analysis Setting Device Registration User Role Complaint

Not Live Live



# Location Tracking – Satellite view



# System Monitoring Parameters : 21<sup>st</sup> April, 2022, 17:01

Heartbeat

Site : SEDM C7826 0	IMEI No. : 861551043977826	Device ID: 5740956643716323773	Time: 21-04-2022 17:05:46
Network Strength: 17	Latitude: 28.456076	Longitude 76.843294	Pump Capacity: 7.5HP

Status:

Pump Controller DAQ 2022-04-21 17:01:02

<b>Day Generated Energy</b> 6.00 KWH	<b>Cumulative Generated Energy</b> 3871.20 KWH	<b>Output Frequency</b> 25.00 Hz			
DC AC	Voltage V 389.00 152.00	Current A 2.60 7.20	Power KW 1.01 1.10		
Max	DC V -	DC A -	DC KW -	Hz -	Flow Speed -

Performance & Status: 2022-04-21 17:01:02

<b>PUMP STATUS (-)</b> RUNNING	<b>SOLAR GENERATING (KW)</b> 1.01	<b>TODAY GENERATED ENERGY (KWH)</b> 6.00	<b>TODAY DISCHARGE WATER (Liters)</b> 16146
<b>TOTAL DISCHARGE WATER (Liters)</b> 10452159	<b>PUMP DAY RUN HOURS (HH:MM)</b> 05:30	<b>PUMP CUMULATIVE RUN HOURS (H:s)</b> 1322.00	<b>WATER DISCHARGE FLOW RATE (LPM)</b> -

# Pump Usage Pattern : 19<sup>th</sup> April 2022





Power Generation







Pump Status

# KUSUM Mobile Application – Live status : 21<sup>st</sup> April, 2022, 18:57




Search By :  Application No  Mobile No

SWPS202001455  



**Farmer Details**

 SWPS/2020/01455	 9013035406
 SHRI PAL SINGH ADISAL	 Premier Solar System Pvt Ltd
 GURUGRAM	 7.5 HP



**Monitoring**

 Live Status  Peformance  Analysis



**Tracking**


 Application Status  Assets  Inspection


**Information**

 Complaint  Completion Report




**Pump Operation**


Press the icon to operate  



 21-04-2022 18:57


 **SCHEDULE PUMP OPERATION**




**Live Status**



 **Solar Generation** **0**   
(KW)  


 21-04-2022 18:57





 **Water Discharge Flow Rate** ---  
(LPM)  










 **Pump Controller Status** **Stop**   
 21-04-2022 18:57

 **Geolocation** **Match**   
Latitude : 28.46 Longitude : 76.84

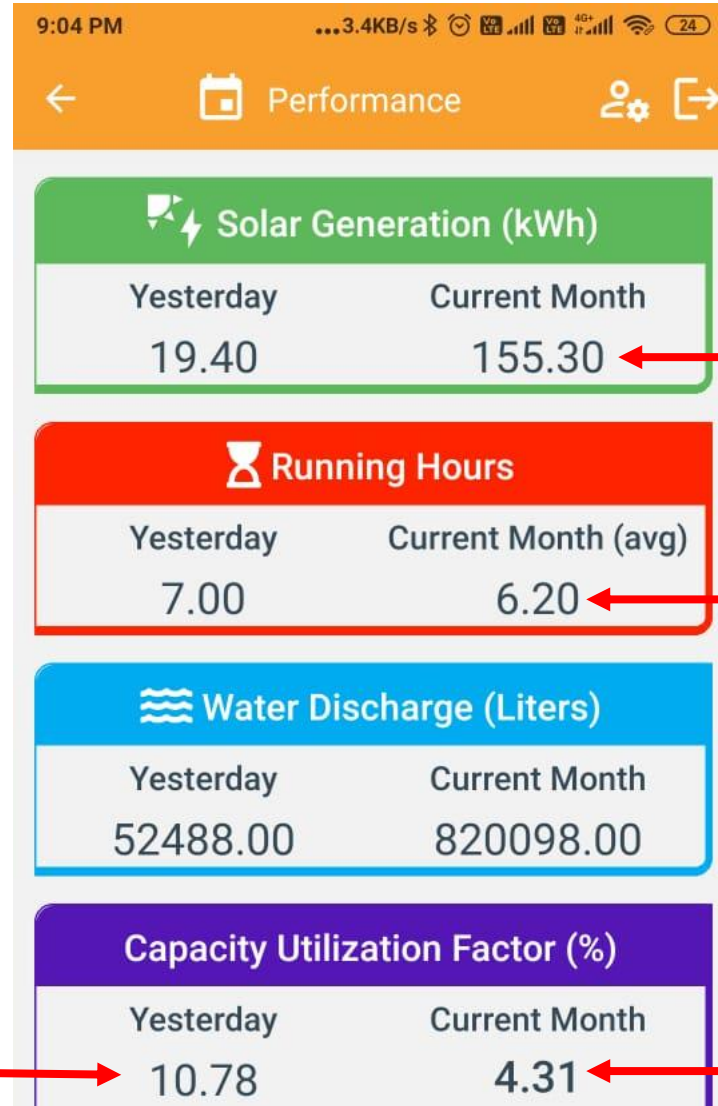
**Today's Parameters**

 **Today's Runtime** **06:00**   
25.00%  (HH:MM)  
 21-04-2022 18:57

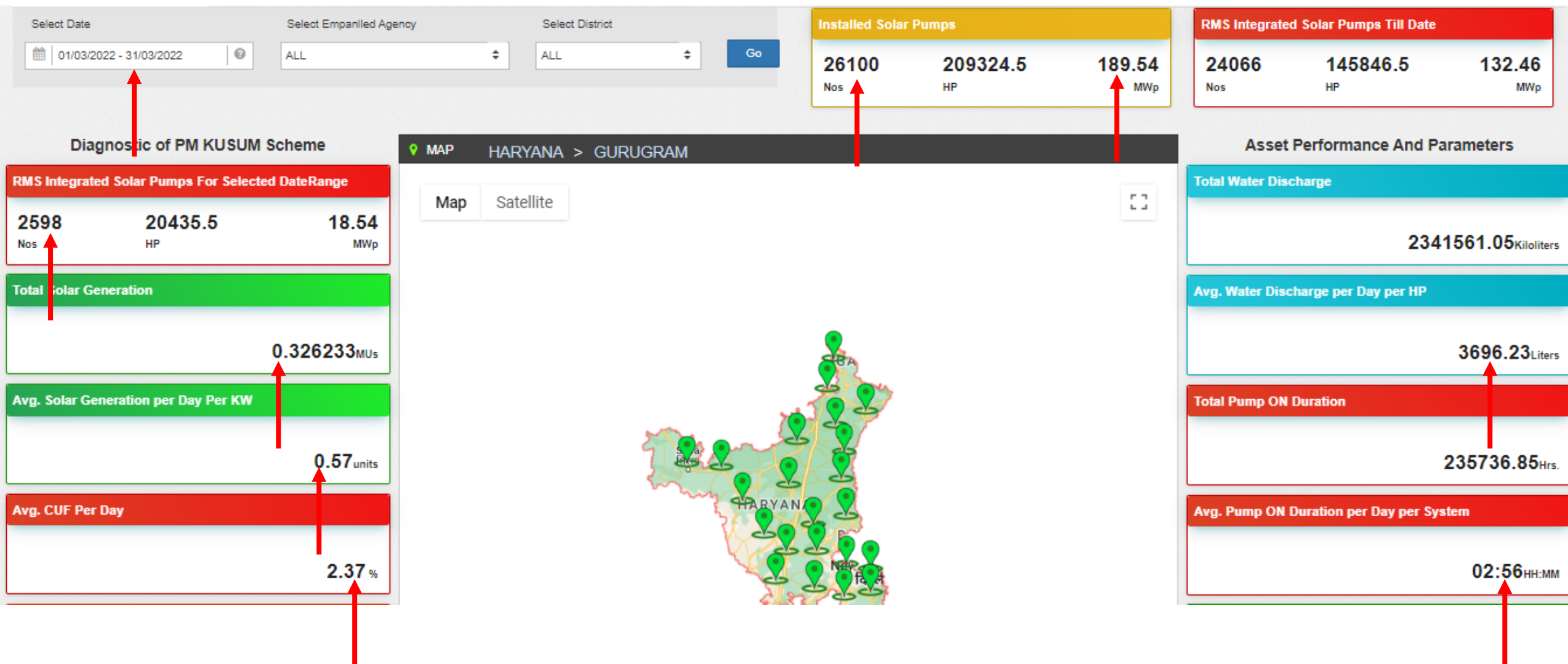
 **Today's Energy** **6.4**   
(KWH)  
 21-04-2022 18:57

 **Today's Water Discharge** **17172**   
(LITERS)  
 21-04-2022 18:57

# KUSUM Mobile App – Performance Analysis



# State Summary : Performance Analysis Dashboard



# Benefits to SIA as well as MNRE

- **Objective of Government is to improve utilization of subsidized assets where state and central government contribution is between 60-90%**
  - Tracking of Assets – Ensuring physical availability of assets
  - Status of Assets – Ensuring functional availability of assets
  - Quality of Supply and services – Ensuring performance of assets
  - Usage of Assets

## ISSUES AND CHALLENGES

### **RMS Data Not Displayed on SEDM Platform**

#### **Possible Reasons :**

- Issues in communication connectivity due to security layers : Certificate, Encryption/Decryption, Username-Password
- Issues in JSON Message Format : Parsing error due to wrong message sent from RMS
- Duplication of ID and credentials (IMEI Number) : SCADA will allow single system to connect at a time against one ID
- RMS not transmitting Data : SIM card signal strength or Whitelisting or recharge issues

#### **Solution :**

- Troubleshooting and Debugging Application is provided to register and view entire data communication with errors

#### **Responsibility :**

- SCADA Software agency to provide Troubleshooting and Debugging for registration of RMS with display of various errors
- SCADA Software agency to provide training to empanelled agencies
- Empanelled agency RMS provider to test and verify his system

### **Long Lat mismatch on SEDM Platform**

#### **Possible Reasons :**

- Manual data entry of Wrong Long-Lat. as a reference given at the time of Survey
- Real Time Data with error of more than 10 Meters.
- Fixed Data Sent by RMS of warehouse or works instead of real time data after installation
- Zero value coming from RMS due to poor signal strength or firmware issues

#### **Solution :**

- Use of GPS module with antenna of proper accuracy and use of EEPROM to store top non zero values

#### **Responsibility :**

- Empanelled agency RMS provider

## **Invalid or Wrong Values of Performance Indicators such as Energy, Running Hours, Water Discharge on SEDM Platform**

### **Possible Reasons :**

- Parameters Not Available
- Engineering Units are different
- Configuration Error
- Calculation errors at RMS / Variable Frequency Drive End
- Duplication of values

### **Solution :**

- Improvement in RMS Design with all required system components : Memory, GPS, Controller
- Verification of System Configuration
- Implementation, Testing, Verification, Validation of Logics at firmware level

### **Responsibility :**

- Empanelled agency RMS provider

SIA shall coordinate between Empanelled agencies and SEDM Platform provider

Both agencies shall follow guideline provided by MNRE for Technical Specifications and communication architecture

SIA shall verify the same against Check List provided by MNRE for each empanelled agency before they start mass deployment

**Thanks**