STANDARD OPERATING PROCEDURE (SOP)

For

Operation and Maintenance for Irrigation Schemes Assam

IRRIGATION DEPARTMENT GOVT. OF ASSAM

Chief Engineer,Irrigation,Assam

Additional Chief Engineer, O&M (Minor & Micro), Irrigation, Assam Additional Chief Engineer, O&M(Major&Medium), Irrigation, Assam

2024

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Standard Operating Procedure (SOP) for Operation and Maintenance of Irrigation Schemes

This comprehensive SOP aims to ensure the sustainable and efficient operation of **Flow and Lift Irrigation systems** (from Surface water) and **Tube Well Irrigation systems** (from Ground water) to optimize water resource management for agricultural productivity in respect of completed scheme.

1. **Purpose**: To maintain continuous functionality of all irrigation systems, preventing breakdowns and ensuring optimal water distribution for diverse agricultural requirements. Its implementation supports long-term sustainability and efficient water usage and efforts to keep the schemes in operation.
2. **Scope:** This SOP covers all components of **Flow and Lift Irrigation Schemes** and **Tube Well Irrigation Schemes** including Storage & Diversion structures (Head Work etc,), Canals, Distributaries, Gates, Pumps and Electrical systems and outlines **daily operational guidelines** as well as protocols for **periodic maintenance** and **emergency response** for preventive as well as defect-rectification measures.

3. General Guidelines

Responsibilities:

Chief Engineer(I) & Chief Engineer(MI): Overall responsibility for implementation and compliance of stakeholders.

- Prepares the Annual plan and work Programme for Irrigation sector.
- Recommend proposals to Govt.for Administrative Approval. Preparation of the annual budget for the maintenance and repair/re-engineering of irrigation schemes
- Resolve disputes that may arise between stakeholders and the department.
- Arrange consolidated ceiling free annual fund allocation to the EE concerned for emergent nature of repairing in order to provide uninterrupted irrigation water supply to the crop fields.

Addl. Chief Engineer, O&M (Major & Medium) & Addl. Chief Engineer, O&M (Minor & Micro): Addl. Chief Engineers are responsible for operation and Maintenance of the schemes and shares duties with Chief Engineer while monitoring activities for timely completion, maintaining quality of works and effective utilization of the fund.

- Develop plan &strategy for efficient operation & maintenance of irrigation schemes.
- Formulate proposals for periodical maintenance and up-gradation of the irrigation projects and submit to Chief Engineer.
- Co-ordinate with all stakeholders for collection of data, operation and maintenance of projects.

Superintending Engineer: Superintending Engineer will monitor of all field

activities under their jurisdiction, provide suggestions, information etc. during time of disaster as per requirement.

- Take up any rectification/modification of works as per site conditions in close co-ordination with Executive Engineer concerned.
- Coordinate with Directorate office regarding the damages occurred and if required they will coordinate the District Authority along with Executive Engineer.

Executive Engineer: The Executive Engineer holds the top-level responsibility for managing all strategic and operational aspects of Irrigation projects at field level and report to CE, SE concerned.This role involves:

- **Resource Allocation:** Ensuring that all aspects of the irrigation project are well-resourced, including staffing, equipment, and materials.
- **Safety and Environmental Regulation Compliance:** Overseeing adherence to all relevant safety and environmental laws and regulations. This ensures the project does not adversely affect the surrounding ecosystem and complies with legal standards.
- **Supervision of Maintenance and Operational Activities:** Directing both routine and critical maintenance operations, and supervising daily operational tasks to guarantee efficient system performance and longevity.

Assistant Executive Engineer: The Assistant Executive Engineer supports the Executive Engineer by handling more direct supervisory duties:

- **Project Monitoring:** Assisting in the oversight of all project phases, from planning through execution, focusing on optimizing processes.
- **Technical Support and Guidance:** Providing technical expertise and guidance to both operators and the maintenance crew, ensuring that all practices adhere to established standards.
- **Quality Assurance:** Monitoring the quality of work and ensuring that the infrastructure is built and maintained to the highest standards. This role often acts as a bridge between field operations and higher management, ensuring smooth communication and effective execution of projects.

Section Officer: The Section Officer manages the day-to-day operations on-site and coordinates between various teams.
Responsibilities include:

- **Daily Activity Oversight:** Overseeing all daily activities on the site, ensuring that operations run smoothly and that all staff adheres to operational protocols.
- **Coordination:** Acting as a coordinator between the maintenance crew and operators, making sure that maintenance schedules are adhered to and that operational adjustments are made in a timely manner.
- **Emergency Response:** Serving as the first point of contact in emergency situations, taking lead in implementing emergency protocols, and communicating with higher management about on- site needs and developments.

Operators: Operators are essential for the day-to-day management of the irrigation system. Their responsibilities include:

- **Handling Daily Operations:** Managing the flow of water through the system, starting and stopping operations as necessary, and making adjustments to meet the day-to-day requirements.
- **Monitoring System Performance:** Keeping a close eye on the systems performance indicators, such as water pressure, flow rates, and general efficiency.

- **Data-Based Adjustments:** Using real-time data and possibly predictive analytics to optimize water distribution, ensuring that water use is efficient and meets the agricultural needs without wastage.

Maintenance Crew: The maintenance crew is crucial for the upkeep of the irrigation system. Their tasks involve:

- **Preventive Maintenance:** Conducting scheduled checks and maintenance activities to prevent system failures. This includes inspecting, cleaning, repairing, or replacing parts of the irrigation system before problems occur.
- **Corrective Maintenance:** Responding to issues as they arise, fixing faults, and replacing damaged components to ensure the system continues to function properly and efficiently.

Operation Procedures

Effective operation of irrigation systems is critical for optimizing water resources and ensuring the sustainability of agricultural practices. These procedures are designed to maximize efficiency while minimizing wear and tear on infrastructure.

Daily Operations

I. **Lift Irrigation & Tube Well Irrigation Systems:**

- **Power and System Checks:** Start each day by checking the availability of electrical power, including the status of back up power systems if applicable. This ensures readiness for operations without interruption.

- **Pump Activation:** Activate the pumps, starting them gradually to stabilize the flow and prevent any sudden surges that could damage the system.

- **Valve Management:** Gradually open control valves, adjusting them to set the desired flow rate according to daily water requirements. This step is crucial for managing the precise delivery of water.

- **System Monitoring:** Continuously monitor the system for any signs of malfunction or inefficiency, such as unusual noises, vibration, or pressure fluctuations, which can indicate potential problems.

II. Flow Irrigation Systems:

- **Gate Adjustments:** Adjust the positions of canal gates according to the pre-planned water distribution schedule. This ensures that water delivery is uniform across all fields and that each area receives its requisite amount based on current needs.

- **Monitoring Water Levels and Flow:** Regular checks on water levels and flow rates are essential to adapt operations to daily demands. This includes making adjustments based on real- time field observations and data from flow meters.

Seasonal Operations

- **Adaptation to Agricultural Cycles:** Modify water delivery schedules to align with the growth cycles of crops during different agricultural seasons, such as the Kharif (monsoon) and Rabi (winter) seasons. These adjustments are based on detailed crop water requirements and expected or observed weather conditions.

- **Increased Water Delivery:** During peak growing seasons or in times of anticipated high precipitation, increase water delivery to support crop growth, ensuring that the system can handle the higher output without stress.

- **Resource Management:** Plan resource allocation, such as manpower and electricity usage,more intensively during peak periods to maintain system efficiency and reliability.

Shutdown Procedures

Lift Irrigation & Tube Well IrrigationSystems:

- **Controlled Valve Closure:** Begin the shutdown process by slowly closing the main control valves. This methodical approach helps prevent water hammer—a hydraulic shock that can cause extensive damage to pipes and system components.

- **System Power Down:** After the water flow is fully halted, turn off the pumps and ensure that all electrical systems are properly shut down. Secure the system to prevent unauthorized access or accidental activation outside of operational hours.

Flow Irrigation Systems:

- **Gate Management:** Systematically close the irrigation gates,while continuously monitoring the water levels to prevent overflows or excessive drying, which could impact crop health and lead to financial loss.
- **Final Checks:** Conduct final system checks to ensure all gates are securely closed and that there are no leaks or potential points of failure that could manifest during off-hours.

Each of these operational procedures involves a blend of mechanical adjustments, system monitoring, and proactive management to ensure the irrigation system operates smoothly and efficiently, adapting to both the daily and seasonal needs of agricultural operations.

4. Maintenance Procedures

Civil Maintenance:

- **Canal Desilting:** Regular desilting of both the main canal and branch canals is crucial. Use machinery such as JCBs for this task, ensuring at least one JCB is available for major/medium irrigation schemes to maintain cleanliness and functionality of the canal system.

- **Canal Repair:** Prior to water distribution to fields, ensure that all canal branches are inspected and necessary repairs are made to prevent water loss and ensure efficient water flow.

- **Maintenance of Masonry Structures:** All masonry structures along the canal, including supports and linings, must be kept in sound condition. Any detected damages should be promptly and thoroughly repaired, with attention to proper curing of repair works to ensure longevity.

- **Wheel Guard Maintenance:** Maintain and regularly inspect wheel guards to ensure they are functioning properly and securely placed.

- **Erosion Control:** In areas downstream of canal structures where erosion due to turbulence or wave action is significant, use riprap made of brick-bats or boulders. If erosion persists despite these measures, investigate further to implement suitable energy-dissipating devices. Maintain and update scour charts showing the depth and extent of scour at least once a year following the annual canal closure.

- **Special Attention to Structures:** Pay particular attention to canal and drainage siphons, and aqueducts, ensuring they are maintained properly to prevent any structural failures.

- **Masonry and Earthwork Junctions:** The junctions where masonry structures meet earthworks should be regularly inspected and maintained. This is a common point for potential breaches; thus, the grouted pitching or lining at these junctions must be kept in proper shape.

- **Canal Bed Maintenance:** Regularly level the canal beds and regularize their gradients by removing siltmounds. Ensure that bed levels are accurately maintained with bed stones placed at close intervals. In smaller canal sections, avoid removing silt from the junction of bed and slopes unless it's to fill scoured portions.

Mechanical Maintenance:

I. **Flow Irrigation Scheme:**
    - **Gate Maintenance:** The rubber sill of the gate of the cross regulator should be replaced every two years to ensure its effectiveness and integrity.
    - **Gate Painting:**To protect against wear and tear, gates should be properly painted at least once a year, which helps prevent rust and prolongs their operational life.
    - **Lubrication:** Properly grease the gates of both the cross regulator and the head regulator regularly to ensure smooth operation and to reduce wear.

II. Lift Irrigation Scheme:

- Barge should be checked regularly-through manhole to identify any leakage on the bottom plate. If hole is noticed immediate steps should be taken to rectify the hole etc.
- Barge should be anchored properly and it should be checked regularly.
- Pump house/ barge should be kept neat and clean, particularly from oil, grease etc.
- Before starting the pump voltage and amperage should be checked.

- All electrical connections should be checked, naked portion of the wires should be insulated properly.
- Priming should bed one properly.
- Keep sufficient reserve of Gland packing, grease, foot valve, leather, pump bearing, magnet coil etc. during season time.
- Proper alignment of pump shaft should be maintained, any type of vibration should be noticed and rectify the same immediately.
- Adequate measures to be taken so that electric motor does not get

inundated.

III. Tube Well Irrigation Scheme:

- Check the required voltage,ampere etc. before starting.
- Any sand should be noticed and pumping should be stopped and report.
- Whether sand mixed water noticed during discharge, if yes, rectify the same.

Electrical Maintenance:

- **Power Supply Maintenance:** Ensure that adequate lighting, generator backup, and diesel supply are always available at the head work site to guarantee uninterrupted operation.

- **Daily Maintenance:** Inspect pumps, motors, and pipelines for any leaks, damage, or abnormal sounds. Lubricate moving parts as necessary, check and clean intake screens and filters, and ensure that all power supply connections are secure.
- **Weekly Maintenance:** Check electrical components and control systems, verify the accuracy of flow meters and pressure gauges, and clean and maintain the pump house and control room.

- **Monthly Maintenance:** Conduct a comprehensive check of the entire system, calibrate control and safety systems, and inspect water quality and treatment systems if applicable.

- **Annual Maintenance:** Dismantle and overhaul pumps and motors, inspect and replace worn- out parts as necessary, evaluate the structural integrity of pipelines and supports, and review and update maintenance records and documentation. Maintenance and repair estimates for existing projects must be submitted by August each year, with the tendering process completed by October, and works finished by February of the following financial year.

5. Defect-Rectification and Damage-Control Procedures

The completed Schemes must be inspected regularly to detect wear & tear. The officer must encourage feedback from the scheme operators and field staff to identify issues. Preparing list of prioritize repair tasks based on critically, considering water wastage, leakage and impact on crop growth during sorting out the repairs under above categories.

- **Immediate Action:** Upon detection of any defects such as leaks, unusual noises, or disruptions in operations, operators are tasked with initiating immediate troubleshooting to identify the source of the problem. This step is crucial to prevent escalation and minimize impact on the system's overall functionality.

- **Defect Reporting:** Operators must promptly report any identified defects to the site in-charge. The report should detail the nature of the defect, initial observations, and any immediate measures taken. This documentation helps in tracking issues and formulating effective response strategies.

Rectification Process:

- **Minor Defects:** Issues such as small leaks, minor electrical faults, or routine wear and tear fall under minor defects. These should be addressed immediately on-site by the maintenance personnel equipped with the necessary tools and parts. The goal is to resolve these issues quickly to maintain continuous operation.
- **Major Defects:** Defects that pose significant risk to the integrity of the irrigation system or require extensive repairs are categorized as major. These defects might include severe structural damages, major leaks, or significant electrical failures. Addressing these issues typically requires coordination with higher management to secure necessary resources and may also necessitate expert consultation. Plans for repair should be formulated quickly and execute dunder close supervision to restore functionality and ensure system safety.

6. Sorting Out the Repair Works under Different Categories:

- Works to be Repaired without Expenditure
- Works to be Repaired Petty/Regular maintenance with minor Expenditure
- Works to be Repaired with substantial Expenditure
- Works under Major Repairing and Feasibility
- Works beyond repairable.

Works to be Repaired without Expenditure:

- Tightening Bolts and Nuts: Regularly inspect and tighten loose bolts and nuts on all equipment and structures in the DTW and LIS
- Adjustment of Valves:Periodically fine-tune valve settings to ensure proper water distribution and pressure by the departmental PPO, Mechanics
- Cleaning Solar Panels: Keep solar panels clean and free of dirt and debris for efficient power generation in case of solar Tube wells
- Software and Firm ware Updates: Regularly update and maintain control system software and firmware where applicable

6.2.Works to be repaired with Petty/Regular maintenance with minor Expenditure

Arrangement of petty budget and release of fund to the Division for petty maintenance such as:

- Cleaning and de-clogging, periodically clean filters, screens and intake stop to prevent clogging.

- Lubrication of moving parts like pump bearing, gears and shafts as per manufacturer recommendation in case of lift irrigation scheme.

- Gasket & seal replacement by regular inspection of gasket and seals and tore place if signs of wear are evident.

- Control System Check: Verify the functionality of control systems, including timers, sensors, and remote monitoring.

- Electrical Connections: Ensure proper electrical connections, and replace damaged wires, switches, or breakers.

- Leak Detection and Repair: Identify and repair minor leaks or blockages in the distribution pipelines.

- Routine Water Quality Testing: Monitor water quality parameters, such as pH, EC, and TDS, and adjust as necessary. This may be carried out at the local Laboratory of PHE authorities.

Works to be repaired with substantialExpenditure:

- Review Past Repairs: Examine records of repairs conducted in the past 1to 3yearsand verify the current condition.

- Scheduled Preventive Maintenance: Implement a preventive maintenance schedule for components repaired in the past.

- Life cycle Assessment: Assess the remaining life cycle of previously repaired equipment and plan for replacements.

A comprehensive list such scheme may be prepared in advance and the estimate may be prepared in order to submit under the head of annual M&R on preference wise.

Works under Major Repairing and Feasibility:

- **Comprehensive Assessment**: Conduct a detailed assessment of the entire irrigation scheme to identify major issues, including structural problems, pump or motor failure, and severe pipeline damage.

- **Budgeting**: Prepare a budget estimate for major repairs, encompassing replacement costs, labor, and materials.

- **Technical Evaluation**: Engage with experts or engineers to evaluate the technical feasibility of repairing or replacing critical components, including motors, pumps, and pipelines. Canal breaches, Erosion control measure, Protection work, Embankment repairs Gates, Roller etc.

- **Environmental Impact**: Evaluate the environmental impact of major repairs, considering factors such as land use and water source sustainability. Weigh this against the benefits of the irrigation scheme.

- **Cost-Benefit Analysis**: Compare the cost of major repairs to the long-term benefits, including increased crop yields and water conservation. Assess the return on investment.

Works beyond repairable condition:

Preparing list of schemes which are beyond repair and preparing proposal for foreclosure of the schemes.

7. Emergency Procedures

Flood Response:

- **Activation of Protocols:** In the event of imminent flooding, activate emergency flood response protocols immediately. This includes operational adjustments to increase the discharge capacity through spillways or other controlled water release systems.
- **Notification:** It is vital to notify downstream communities and local authorities about potential flooding to enable timely evacuations and deployment of emergency services. This helps in minimizing the risk to life and property.
- **System Monitoring:** Throughout the flood event, continuous monitoring of water levels and system integrity is essential to adapt responses to changing conditions and mitigate potential damages.
- **Gate operation:** Regular Gates in case of FIS should be kept open during flood time.
- **Pump & Motors**: In flood prone area, on inundation the pump & motors are to

be shifted to a safe place and the same are to be re-installed after receding of flood water.

Drought Management:

- **Reduced Water Output:** Implement measures to reduce water output conservatively during drought conditions. This involves adjusting the flow in irrigation channels and temporarily suspending water delivery to non-critical areas.
- **Prioritization of Water Distribution:** Focus on distributing available water to critical areas where agricultural demands are highest or where crops are at a critical growth stage. This prioritization ensures that limited water resources are used effectively to sustain agricultural output.
- **Engagement with Agricultural Stakeholders:** Work closely with local farmers and agricultural stakeholders to implement effective water rationing strategies. This collaboration helps in aligning water distribution plans with actual field requirements and promotes the adoption of water-saving practices among the community.

8. Inspection and Monitoring

- **Routine Inspections:** Conduct systematic inspections of all system components, from pumps and electrical wiring to canals and structural supports, to ensure they are in optimal condition.
- **Use of Technology:** Deploy advanced monitoring technologies like SCADA systems to enable real-time monitoring and control over all aspects of the irrigation systems.
- **Integration of digital monitoring** through the IIPMS portal to ensure real-time tracking and better management of data .

9. Record Keeping and Reporting

- **Data Management:** Keep detailed records of all operational data, maintenance activities, and any incidents or anomalies noted during operations.
- **Reporting Mechanisms:** Prepare and submit detailed reports on a regular basis to management, detailing operational efficiency, issues encountered, and suggestions for improvement.
- **Failure to Update Data:** Any failure to update or correctly record any data related to operations of Irrigation Department should be tracked through digital monitoring in IIPMS and linked to the ACR of the corresponding officer for accurate evaluation and reporting.

Reporting forms

These are standardized documents used to record and communicate information about specific incidents, activities, or observations related to maintenance and operations. In the context of irrigation schemes, reporting forms help ensure that issues are documented, tracked, and addressed systematically. Here are key components and examples of reporting forms relevant to irrigation maintenance:

Key Components of Reporting Forms

1. Title/Header:
    - Clearly state the purpose of the form(e.g., "Maintenance Issue Report, "Inspection Report").
2. Date and Time:
    - Record when the issue was observed or when there port issubmitted.
3. Location:
    - Specify the exact location of the issue (e.g.,section of canal, pump station).
4. Reporter Information:
    - Name, title, and contact information of the person reporting theissue.
5. Description of Issue:
    - Detailed explanation of the problem, including specific symptoms and observations.
6. Severity Level:
    - Categorize the issue as minor, moderate, or critical based on its impact on operations.
7. Photos/Attachments:
    - Include photographs or diagrams as applicable.
8. Actions Taken:
    - Document any immediate actions taken in response to theissue.
9. Follow-Up Actions Needed:
    - Recommend next steps for resolution.
10. Status:
    - Indicate whether the issue is resolved,pending,or requires further assessment.
11. Signatures:
    - Signatures of the persons reporting and addressing the issue, along with the date.

Customization

Like maintenance checklists, reporting forms should be customized to fit

the specific needs of your irrigation schemes and the types of issues typically encountered. Regular reviews can help keep them effective and relevant.

10. Safety and Environmental Considerations

- **Safety Protocols:** Maintain strict adherence to safety standards, ensuring that all personnel wear the appropriate safety gear and are trained in emergency procedures

.

- **Environmental Compliance:** Regularly review operations to ensure they do not adversely affect the local ecosystem, adhering to all local and national environmental regulations.

11. Training and Development

- **Ongoing Training:** Regularly schedule training sessions to keep all staff updated on the latest irrigation technologies, safety practices, and operational procedures.

- **Skill Enhancement:** Encourage staff to participate in external workshops and seminars to further enhance their technical and operational skills.

Training materials:

These are resources designed to educate and inform personnel about specific processes, skills, or knowledge areas.In the context of irrigation schemes, these materials are essential for ensuring that staffs are well-equipped to perform their roles effectively and safely. Here are common types of training materials used in this field:

Manuals and Guides

- Operation Manuals:Detailed instructions on how to operate irrigation equipment and systems (e.g., pumps, valves).
- Maintenance Guides:Step-by-step procedures for performing routine maintenance and repairs.
- Safety Manuals: Information on safety protocols and emergency procedures related to irrigation operations.

Checklists

- Training Checklists: Lists of skills or topics to be covered during training sessions.
- Maintenance Checklists: Standard procedures for regular inspections and repairs,used as reference materials during training.

Presentations

- PowerPoint Slides: Visual presentations covering key topics such as system operations, maintenance procedures, and safety practices.
- Webinars:Online training sessions that can include live demonstrations or discussions.

Photographs and Videos

- Photographs with location (latitude & longitude) before, after and during execution of the M&R works to be captured and submitted along with estimates and bill.
- Instructional Videos: Short clips demonstrating specific procedures (e.g.,pump maintenance, troubleshooting techniques).
- Safety TrainingVideos:Visual materials highlighting safety practices and protocols.

Handouts and Reference Materials

- Fact Sheets:Quick-reference documents summarizing key information about irrigation systems and best practices.
- FAQs: Answers to common questions about maintenance andoperation.

Workshops and Training Sessions

- In-Person Training: Hands-on training sessions covering operation and maintenance of irrigation systems.
- Field Training: Practical training in the field,allowing staff to apply what they've learned in a real-world setting.

Assessment Tools

- Quizzes and Tests:Tools to evaluate understanding of the trainingmaterial.
- Feedback Forms:Surveys to gather feed back from participants on the training's effectiveness.

Simulation Tools

- Software Simulations:Programs that simulate irrigation system operations for training purposes.
- Physical Models:Scaled models of irrigation systems used for demonstration and practice.

12. Review and Improvement

- **Annual Reviews:** Conduct thorough annual reviews of all systems and procedures to assess their effectiveness and make necessary adjustments based on feedback and new challenges.
- **Continuous Improvement Process:** Foster a culture of continuous improvement, encouraging feedback from all staff members and integrating new technologies and practices that enhance system efficiency and sustainability.

13. Proposal of Schemes for Maintenance and Repairing:

i. Annual plan of Schemes on priority basis.
ii. 5years plan of Schemes.
iii. List of Schemes with tentative amount to be proposed under EAP/NEC/DRSCetc.

14. Preparation of Plan and Estimates

Salient features of an Estimate

- **Drawing&design**

  Detailed drawings of the proposed works should be enclosed with the estimate. If any new structure is proposed, detailed design must be enclosed with the estimate.

- **Proposed work to be highlighted**

  The area to be repaired, length, component considered in the estimate shall be highlighted in the submitted drawing.

- **Feasibility report**

  The feasibility report justifying the nature of work proposed shall be given by the concerned Superintending Engineer after necessary site visit and the same shall be incorporated with the estimates.

- **Justification Reports**

  Justification reports from the Executive Engineer & the Superintending Engineer concerned shall be submitted.

- **Non Duplicity certificate**

  Non Duplicity certificate should invariably be incorporated with theestimate.

- **A and G Forms:**

  A and G forms shall be filled up properly.

- **Checklists**

  Check lists shall be duly filled up and incorporated in theestimate.

- **Cost-benefit Ratio (BC ratio)**

  Benefit cost ratio shall be worked out based on the Cropping pattern before and after irrigation duly approved by the District Agricultural Officer. Rate of produce and quantity of yield shall be as per recommendation of agricultural department. In case of M&R estimates prepared under Head of Account (HoA) other than M&R HoA, the M&R Estimated Cost shall be considered omitting the original/revised estimated cost of the scheme, and command area to be revived shall be considered in the calculation of the BC ratio for the M&R proposal.

- **Report**

  Report of the estimate shall justify the repair work proposed and area to be revived. This has to tally with the damage report of the scheme as updated in IIPPMS portal. A brief report narrating the history of the scheme in respect of the year of initiation, amount involved, potential created, potential lost, and present potential available shall be mentioned in the report. Any previous works including M &R shall be mentioned indicating the year and amount. Estimated provision of works kept in the proposed M&R estimate is also to be included in the report.

- **Abstract of Cost**

The abstract of cost should include labour cess, forest royalty etc as per current norms prevailing in the state.

- **Rates of Items**

The estimates hall be prepared as per the current Schedule of Rates of the department.To workout the total cost of project in detail the cost of various units should be compiled in tabular form according to the current SOR.

Items of works for which rates are not available in the current SOR of the department, analysis shall be carried out based on logical market rate of materials and labour to minimise cost of expenditure as per prevailing procedure.

Budget of M&R Works

M&R works fall into following three categories based on budgetprovision:

i) Normal M&R works

This category includes the maintenance works required due to the normal wear and tear that occurs in any irrigation system in due course of time or due to sudden unseen damages. The same is to be informed to the higher authority of the department and also to be uploaded in the IIPPMS portal along with photographs of the damages.Accordingly proposal for M & R should be submitted for necessary approval.

ii) Maintenance required for Disaster induced damage under ASDMA

This category includes the damages that occur in any irrigation system due to natural or man-made calamity such as flood, drought, etc. Such proposal repairing in nature shall strictly be prepared as per prevailing guidelines of ASDMA. The damage which will be incorporated in the proposal shall be informed immediately after occurrence of the event to the District Authority and report should be submitted in the DRIMS portal.

SDRF works of estimated cost upto Rs. 2.00 lakh per proposal: As per ASDMA norms, approval and payment ct Commissioner concerned, and works are to be carried out according to prevailing ASDMA for damage of irrigation infrastructure due to disasters upto Rs. 2 lakh are to be taken up with the Distriguidelines.

(iii)**SOPD-FDR works**

Maintenance & Repairing works for flood induced damage above Rs. 2.00 lakh preferably may be taken up under SOPD FDR. The estimates should be countersigned by the District Commissioner concerned and should also mandatorily include the damage information report as uploaded in the DRIMS portal, which are then to be submitted to Department for further approval.

15.0 Planning and Implementation of M & R Works :

With a view to proper planning and optimizing the cost of Maintenance & Repair (M&R) works of different Irrigation Schemes during a Financial year and attending M&R of more nos of Irrigation Schemes, the following procedures shall henceforth be practised.

i. The Chief Engineer (I)/Chief Engineer(MI) shall invite the proposals from the Divisional Engineers for M & R works, based on the budgetary provisions for the financial year immediately within one week of budget communication.
ii. The Executive Engineer (EE) shall assess the volume of repair work as per actual damage on the ground and frame the estimates accordingly and submit it to the Chief Engineer (I)/Chief Engineer(MI) as the case may be. Thereafter, the Chief Engineer (Irrigation)/Chief Engineer(MI) shall examine the proposal and recommend accordingly to Government for obtaining Administrative Approval..The concerned EE shall give due consideration of the Crop Water demand , Warabandi Plan etc of the Water User Associations, Crop Intensification, Crop Diversification, Soil and Farmer Profile Analysis etc for miking a priority list of schemes for M & R works.
iii. The concerned Ex Engineer as per his/her delegated financial power shall float the tender for emapanelment of contractors for executing M & R works by the first/second week of every financial year so that a list of eligible contractors may be empaneled and the rates may be discovered based on the percentage rate tender with reference to the Prevailing Departmental Schedule of Rates/ Sanctioned Estimates as the case may be Therefore, in compliance of the extant provisions of Assam Public Procurement Rules 2020, a general percentage rate/item rate tender shall be floated for the repair of different Irrigation Schemes under the division without any reference to the quantity of works. The EE will identify the contractors and discover the unit rate based on percentage/item rate contract with approval of immediate next higher authority and execute an annual item rate contract . While issuing the work order to the contractor, the concerned EE shall take the quantities from sanctioned TS estimate. The rate(s) discovered by one Divisional Engineer shall not be repeated for next financial year and may not be applicable to other division
iv. The EE shall personally visit the schemes that require immediate maintenance and repair and shall direct his team of engineers under the control of concerned AEE to assess the actual damage of structures/requirement of spares/parts for the scheme etc .
v. Considering the annual budgetary allocation for M & R works under the revenue head, it becomes imperative that a people friendly approach may be adopted in such a way that the actual quantum of materials and labour as required shall be assessed as per market rates/Basic Schedule Rates of Materials and Labour and necessary allowance required for statutory deductions and contractor’s profit on the estimated cost be duly incorporated. If it is found that M& R works assessed as per departmental SOR is on the higher side, then the people friendly approach as mentioned above may be adopted.to examine whether the consideration of estimate based on Material Cost and Labour Cost in stead of SOR based Item Rate Estimate is more economical leading to cost optimization in which case the department would be in a position to attend M& R of more schemes.
vi. If the rates for materials and skilled labours are not available in the basic schedule of rates, market survey shall be made through a spot purchase committee consisting of technical and accounts officers to collect quotations for the requisite materials from the market and to establish the lowest rates so that the same may be used for estimation purposes.
vii. In the case of some urgent petty purchases for items like civil , electrical or mechanical spare materials etc required for immediate restoration within the delegated power of EE, Work/Purchase order may be placed directly by EE

with prior intimation to higher authority (SE/ACE/CE) to the agency after establishing the lowest rates through Spot Market Committee subject to condition that the same are duly incorporated in the cost estimate and payment shall be made subject to availability.

viii. The estimates framed by the EE shall immediately referred to concerned Superintending Engineer (SE), who will apply his/her checks and forward the estimates within two working days to the respective Additional Chief Engineer, Operation &Maintenance, (Major & Medium/Minor).

ix. The Additional Chief Engineer, Operation &Maintenance (Major & Medium/Minor), will scrutinize the estimates, prioritize the work and finalize the list of the proposals based on

(Major/Minor) respectively for his approval with necessary technical vetting by mechanical and electrical wings, if required. In principle approval of Hon'ble Minister of Irrigation Department shall also be sought to finalize the list of M & R proposals of Irrigation Schemes for Administrative Approval.

x. The priority list of such projects duly approved by Hon'ble Minister, Irrigation shall be submitted along with the cost estimates to the Government for accord of Administrative Approval(AA). As a matter of practice, the priority list of M&R works along with the estimates shall be submitted to the Govt. by the 30th June of financial year so that the necessary approval may be accorded in the first week of July of the Financial Year.

xi. Immediately after obtaining AA from Govt, the concerned procurement entity depending on his delegated financial power as per DFP Rules 2022 shall accord for technical sanction (TS)

xii. Immediately within three days of TS, the concerned procurement entities as per his/her delegated financial power shall issue work order to the eligible contractors already empaneled beforehand as mentioned in Para3.

xiii. It becomes mandatory for all the procurement entities to ensure that there is no any deviation between T.S and A.A estimate. T.S estimate will be detailed cost estimate of the sanctioned A.A estimate.

xiv. In case there is any deviation in the execution of the repair works, the concerned EE shall immediately prepare revised T.S estimate based on actual execution in the site and obtain approval from the competent authority according the original TS.

xv. The work orders of all the sanctioned M &R works shall be issued by August of the Financial year. A condition shall be put to ensure that the work may be started on the ground immediately within 3(three) days of issue of Work Order and clearly mention the maximum time the work may require to complete. Naturally, the M & R works are completed within one month from the date of start. However, depending on the size of work, the time period of completion may vary.

xvi. The concerned EE under all circumstances shall ensure that all M & R works sanctioned for the division are completed in all respect by the end of November of the Financial year.

xvii. There should not be running bills of the M & R works. The bills for the completed work shall be prepared by the EE within seven days from the date of completion. Therefore, he/she will submit the demand of fund for the completed works to SE for his/her counter signature/verification. The SE will

immediately cause an inspection on the ground and submit an inspection report and the forward the demand of fund to Chief Engineer(I) accordingly. In general, the EE should invite the SE for inspection and monitoring before/during and at the completion stage. The SE if not satisfied with the works shall pass the order for necessary action/rectification etc as the case may be. Once the demand is received by Addl CE, O & M he/she will verify the proposal for financial sanction along with his recommendation. The Chief Engineer will allocate the budget and send the proposal to Government for processing of Financial Sanction & Concurrence by Finance Department.

xviii. By the 15th of December of financial year all FS for M & R works shall be submitted to the Government so that entire budgetary allocation ofthe Financial year can be liquidated.

xix. Immediately, after completion of M&R works, the date of executed work shall be passed to IT and Data Management Cell for necessary records, assessment and output/outcome.

xx. All scheme shall be implemented within the budget provision under relevant head of account following all financial norms and procedure, provision of APPR,2020. Delegation of financial power vested with the authority etc shall be strictly adhered to.

16.Conclusion

This SOP serves as a guideline for the Operation and Maintenance (M&R) of **Lift Irrigation Schemes, Flow Irrigation Schemes and Tube Well Schemes** with a focus on efficient water distribution and equipment reliability. Preventive measures, regular monitoring, maintenance, and safety measures are crucial to ensure the success of these Irrigation Schemes. The Assistant Executive Engineer and Section Officer will be in constant touch with the Water Users Association and be given time to time information at the time of natural calamity. The Executive Engineer and Superintending Engineer will take initiatives and immediately communicate with the higher authority along with proposal or fund allocations for maintenance and repair of any defect found of existing projects on time to ensure efficient supply of water to the beneficiaries for agricultural and other uses for Socio- economic development.

GOVERNMENT OF ASSAM
IRRIGATION DEPARTMENT::WORKS BRANCH
BLOCK-B, 2nd FLOOR, JANATA BHAWAN
DISPUR GUWAHATI-6
No.E-593981/27

To : The Chief Engineer,
Irrigation, Chandmari,
Guwahati-03

Sub : Standard Operating Procedure (SOP) for operation and Maintenance for Irrigation Scheme Assam.

Sir,

With reference to the subject cited above, I am directed to convey the approval of the Government on the enclosed Standard Operating Procedure (SOP) for Operation and Maintenance for Irrigation Schemes, Assam and request you for strict compliance of the same.

This issues with the approval of Hon'ble Minister, Irrigation, Assam.

Enclose : As stated.

Yours faithfully,

Signed by
Gopal Chetri
Date: 01-03-2025 13:57:22

Deputy Secretary (W) to the Govt of Assam,
Irrigation Department, Dispur, ,Guwahati-06

Memo.No E-593981/27-A
Copy to:
1) The Secretary to the Govt of Assam, Irrigation Department, Dispur, Guwahati-06 for favou of his kind information.
2) The Chief Engineer, (MI) Irrigation, Assam, Chandmari, Guwahati-03 for kind information.
3)The Chief Engineer,MO&M (Minor/ Micro), Irrigation, Assam, Chandmari, Guwahati-03 for kind information.
4) All Addl CEs under Irrigation Department for kind informtion and necessary action.
5)All SEs under Irrigation Department for kind informtion and necessary action.
6) OSD to HMI for kind information of HMI.
7)Al EEs under Irrigation Department for kind informtion and necessary action.
8) The Addl. Chief Engineer, O&M (Major/Medium) Irrigation, Assam, Chandmari, Guwahati-03 for kind information.
9) P.S. to Spl. Chief Secretary to the Govt of Assam for kind appraisal of Chief Secretary, Irrigation, Dispur, Guwahsti-06
10) The Web Manager, Irrigation, Assam, Chandmari, Guwahati-03 for kind information & He is requested to upload the SOP in Irrigation Website.

e-signed
Deputy Secretary(W) to the Govt of Assam,

Irrigation Department, Dispur, ,Guwahati-06