

**GOVERNMENT OF INDIA
CENTRAL WATER COMMISSION**



**TENDER DOCUMENT
FOR
ANNUAL MAINTENANCE CONTRACT
OF**

TELEMETRY SYSTEM INSTALLED IN CHAMBAL AND MAHANADI BASIN

**EXECUTIVE ENGINEER
CENTRAL WATER COMMISSION
CHAMBAL DIVISION**

**84/ 93-96, Ajay Marg, Pratap Nagar,
Sanganer Jaipur-302 033**

Certified that this Tender Document contains 86 pages marked as 1 to 86

TABLE OF CONTENTS

Items	Particulars	Page No.
SECTION -I.	PRESS NOTICE & NOTICE INVITING TENDERS CPWD-6 & ELIGIBILITY CRITERIA	3-8
SECTION- II.	CPWD-7/8 & SCHEDULE	9-12
SECTION- III.	SCOPE OF WORKS	13
SECTION-IV.	SPECIAL CONDITIONS OF CONTRACT	14-29
ANNEXURE-1A,1B	SCHEDULE OF QUANTITIES	30-31
ANNEXURE-2A,2B, 2C,2D,2E	LIST OF PARAMETER, SPECIFICATION AND EQUIPMENT'S INSTALLED AT DATA AQUISITION SITE AND EARTH RECEIVING STATION, JAIPUR	32-40.
ANNEXURE- 3A,3B,3C,3D,3E	DETAILS OF TELEMETRY STATIONS IN MAHANADI BASIN	41-81
ANNEXURE-4	LIST OF STATIONS INSTALLED IN MAHANADI BASIN WHICH ARE TO BE MADE FUNCTIONAL	82
ANNEXURE-5	FORMAT OF DATA TO BE RECEIVED AT DDRGS	83-84
ANNEXURE-6	PERFORMANCE SECURITY FORM	85
ANNEXURE-7	LIST OF SPARES AT CHAMBAL & MAHANADI BASIN	86

SECTION-1

(प्रेस नोटि)

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भारत के राष्ट्रपति की ओर से अधिषासी अभियन्ता, चम्बल मण्डल, केन्द्रीय जल आयोग, 84/93-96, अजय मार्ग, प्रताप नगर, सांगानेर, जयपुर-302033 भारत में जेनुअन/योग्य ठेकेदारों से चम्बल व महानदी बेसिन में स्थापित टेलीमेट्री सिस्टम के रखरखाव हेतु 09.06.2011 के 15.00 बजे तक मुहरबन्द निविदा आमंत्रित करते हैं जिसे उसी दिन 15.30 बजे खोला जायेगा।

अनुमानित लागत	अर्नेस्ट मनी डिपोजिटेड	निविदा की कीमत	कार्य समाप्ति की अवधि
46915300/-	938306/-	1500/-	3 o"kZ

1. निविदा फार्म, नियम व शर्तों सहित 06.06.2011 के 16.00 बजे तक किसी भी कार्य दिवस में कार्यालय समय 10.00 से 17.00 बजे तक निविदा की कीमत ;नॉन रिफण्डेबल द्द रू0 1500/- का अकाउन्ट पेयी डिमाण्ड ड्राफ्ट द्वारा किसी भी शैड्यूल बैंक में जो कि अधिषासी अभियन्ता, चम्बल मण्डल, केन्द्रीय जल आयोग, जयपुर के पक्ष में जयपुर में देय हो, भुगतान कर प्राप्त किया जा सकता है। टेन्डर फार्म के लिए म.उंपस से प्राप्त अनुरोध को स्पीड पोस्ट/रजिस्टर्ड पोस्ट द्वारा रू0 250/- के अतिरिक्त भुगतान पर डिस्पेच किया जायेगा।
2. निविदा डोम्यूमेंट तथा अन्य विवरण <http://www.cwc.nic.in> वेबसाइट पर उपलब्ध है।

ह0/-
अधिषासी अभियन्ता

(Press Notice)

**NOTICE INVITING TENDER
CENTRAL WATER COMMISSION**

The Executive Engineer, Chambal Division, CWC, 84/ 93-96, Ajay Marg, Pratap Nagar, Sanganer Jaipur-302 033 ,on behalf of President of India , invites the sealed tenders from Genuine and eligible contractors up to 1500 Hrs. on 09.06.2011 for the work of ANNUAL MAINTENANCE CONTRACT OF THE TELEMETRY SYSTEM INSTALLED IN CHAMBAL AND MAHANADI BASIN and will be opened on the same date at 15.30 hrs.

Estimated Cost (Rs. in Lakh)	Earnest Money Deposit (Rs. in lakh)	Cost of Tender Document (Rs)	Period of completion
46915300	938306	1500	3 YEARS

1. Tender forms along with Terms and Conditions can be purchased upto 16:00 hours on 06.06.2011 on all working days during office hours (10.00 to 17.00 hours) on payment of **Rs. 1500/-** through A/C payee Demand Draft (non - refundable) drawn on any scheduled bank in favour of the Executive Engineer, Chambal Division, CWC, Jaipur payable at Jaipur. Tender forms requested by mail will be dispatched by Speed Post/ Registered Post on payment of extra amount of Rs. 250/-.
2. The tender document and other details are available on the website <http://www.cwc.nic.in>.

Sd/-
Executive Engineer (CD)

CPWD-6

GOVERNMENT OF INDIA
CENTRAL WATER COMMISSION
OFFICE OF THE EXECUTIVE ENGINEER
CHAMBAL DIVISION
84/93-96, Ajay Marg, Pratap Nagar, Sanganer
JAIPUR

No.:CD-J/HQ-60/2011/

Dated:

NOTICE INVITING TENDERS

- 1.0 Item rate sealed tenders are invited on behalf of the President of India from the genuine & eligible contractors for work of ANNUAL MAINTENANCE CONTRACT of Telemetry System installed in the Chambal Basin and Mahanadi Basin.
- 1.1 The work is estimated to cost **Rs 46915300/-**. This estimate, however, is given merely as rough guide.
- 1.2 The Eligibility Criteria for issue of tender documents is enclosed. The tenderers shall produce proof from the appropriate Authorities of fulfilling satisfactorily the eligibility criteria and the same could be inspected.
2. Agreement shall be drawn with the successful tenderer on prescribed Form No. CPWD 7/8 which is available as a Govt. of India Publication. Tenderer shall quote his rates as per various terms and conditions of the said form, which will form part of the agreement.
3. The time of contract will be three years from 31-07-2011.
4. The site for the work is available.
5. Receipt of applications for issue of forms will be stopped by 1600 Hrs. of 04.06.2011 and issue of tender forms will be stopped by 16.00 hrs of 06-06-2011.
6. Tender documents consisting of plans, specifications, and the schedule of quantities of the various classes of work to be done and the set of terms & conditions of contract to be complied with by the contractor whose tender may be accepted and other necessary documents can be seen in the office of the Executive Engineer, Chambal Division, Central Water Commission, 84/93-96 Ajay Marg, Pratap Nagar, Sanganer, Jaipur- 302033 between hours of 11:00 AM. to 04:00 P.M. everyday except on second Saturday of the month, Sundays and public holidays. Tender documents, excluding standard form, will be issued from his office, during the hours specified above, on payment of Rs. 1500 /- through A/C payee Demand Draft in favour of Executive Engineer, Chambal Division, CWC, Jaipur payable at Jaipur.
7. The tenderers downloading the tender document from website shall enclose the cost of tender document i.e Rs. 1500/- in the form of A/C payee demand draft (Non-Refundable) drawn on any schedule bank in favour of Executive Engineer, Chambal

Division, CWC, Jaipur payable at Jaipur along with the tender document at the time of submission.

8. The bid shall be accompanied by Earnest Money (unless exempted) of **Rs 938306/-** as Demand Draft in favour of Executive Engineer, Chambal Division, CWC, Jaipur. Contractor exempted from depositing earnest money in individual cases shall attach with the tender an attested copy of the letter exempting him from depositing earnest money and shall produce the original when called upon to do so. If the bid does not contain the specified earnest money, the tender will be summarily rejected.
9. Tenders, which should be placed in sealed envelop, with the name of work and due date written on the envelope, will be received by the Executive Engineer, Chambal Division, CWC, Jaipur up to 03:00 PM on 09-06-2011 and will be opened by him or his authorized representative in his office on the same day at 03: 30 PM.
10. The Contractor whose tender is accepted, will be required to furnish performance guarantee of 5% (Five Percent) of the tendered amount within the period specified in Schedule-F. This guarantee shall be in form of cash (in case guarantee amount is less than Rs 10,000/-) or Deposit at call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any scheduled bank (in case guarantee amount is less than Rs1,00000/-) or Government Securities or Fixed Deposit Receipt or Guarantee Bonds of any Scheduled Bank or state Bank of India in accordance with the prescribed form.
11. The description of work is as follows:
Annual Maintenance Contract of the Telemetry System installed in Chambal and Mahanadi Basin
(Details of the work are given in Section-III of this document.)
12. Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to the nature of the equipment (so far as is practicable), the form and nature of the site, the means of access to the site, and in general shall themselves obtain all necessary information as to, risks, contingencies and other circumstances which may influence or affect their tender. Tenderer shall deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent upon any misunderstanding or otherwise shall be payable. The tenderer shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and local conditions and other factors having a bearing on the execution of the work.
13. The competent authority on behalf of the President of India does not bind itself to accept the lowest or any other tender, and reserves its right to reject any or all of the tenders received without assigning any reason thereof. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rate quoted.
14. All tenders in which any of the prescribed conditions are not fulfilled or any condition including that of conditional rebate is put forth by the tenderer shall be summarily rejected.

15. Canvassing whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.
16. The contractor shall not be permitted to tender for works in the Hydrological Observation Circle, CWC, Noida (responsible for award and execution of contracts) in which if his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any Gazetted officer in the Central Water Commission or in the Ministry of Water Resources. Any breach of this condition by the contractor would result in barring him for quoting in all the future tenders floated by the Central Water Commission.
17. No Engineer of Gazetted rank or other Gazetted Officer employed in the Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service without the previous permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the tender or engagement in the contractor's service.
18. The tender for the execution of job shall remain open for acceptance for a period of 60 days from the date of opening of tenders. If any contractor withdraws his tender before the said period or issue of letter of acceptance, whichever is, earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the Department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the tenderer shall not be allowed to participate in the re-tendering process of the work.
19. This Notice Inviting Tender shall form a part of the contract document. The successful contractor, on acceptance of his tender by the Accepting Authority shall, within 15 days from the stipulated date of start of the work, sign the contract consisting of:-
 - a) The Notice Inviting Tender, all the documents including general/special terms and conditions, specifications and drawings, if any, forming the tender as issued at the time of invitation of tender, technical & price bids submitted by the contractor and acceptance thereof together with any correspondence leading thereto.
 - b) Standard CPWD Form-8.
 - c) Schedule of quantities with duly filled rates & signed by the contractor(s).
20. The successful contractor, on acceptance of his tender by the Accepting Authority shall, within 15 days from the stipulated date of start of the work, sign the separate contract with respective Engineer-in-Charge of Chambal and Mahanadi Basin.
21. Special Conditions of Contract are given at Section-V. In case of any conflicting conditions, terms and condition given elsewhere in the tender document, the special conditions as outlined in Section-V shall prevail.

Signature of Divisional Officer
For & on Behalf of President of India

Eligibility Criteria

SL.	Criteria
1.	Registration: Valid Income Tax clearance certificate & company Registration
2.	Turnover Details: Turnover during last 3 years should be more than Rs. 470 Lakh.
3.	Similar* Works successfully completed during last seven years: i) Three similar works* of at least Rs 188.00 Lakh each or ii) Two similar works* of at least Rs 235.00 Lakh each or iii) One work of at least Rs 376.00 Lakh.
4.	Performance Report: A performance report from the Government department/ Public undertakings duly signed by the competent authority, of having successfully completed similar works* and/or satisfactory performance in works being handled.
5.	Undertaking of not being blacklisted: An undertaking in the specified Performa that the contractor has not been blacklisted anywhere in past.

* Similar Work means the work of Annual Maintenance Contract/Installation of Telemetry system and associated equipment.

SECTION- II

GOVERNMENT OF INDIA CENTRAL WATER COMMISSION

Department : Central Water Commission
CIRCLE : Hydrological Observation Circle, Noida (UP)
DIVISION : Chambal Division
ORGANISATION : Yamuna Basin Organisation
Tender for the work of :

Annual Maintenance Contract of telemetry System Installed in Chambal and Mahanadi Basin

- (I) To be submitted by.....hours on.....to Executive Engineer,
Chambal Division CWC, Jaipur (Rajasthan)
- (II) To be opened in presence of tenderer (s) who may be present at
..... Hours on..... in the office of Executive Engineer,
Chambal Division CWC, Jaipur (Rajasthan)
- (III) Issued to _____
(Contractor)

Signature of officer issuing the Document_____

Designation_____

Date of Issue_____

TENDER

I/We have read and examined the Notice Inviting Tender, Schedule A, B, C, D, E & F. Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the specified work for the President of India within the time specified in Schedule 'F', viz., schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respects in accordance with, such conditions so far as applicable.

I/We agree to keep the tender open for Sixty (60) days from the due date of submission thereof and not to make any modifications in its terms and conditions.

A sum of **Rs 938306/-** is hereby forwarded as demand Draft of a Scheduled Bank as earnest money. If I/we, fail to furnish the prescribed performance guarantee within

prescribed period, I/we agree that the said President of India or his successors in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely.

Further, if I/we fail to commence work as specified, I/we agree that President of India or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely, otherwise the said earnest money shall be retained by him towards security, deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, up to maximum of the percentage mentioned in Schedule 'F' and those in excess of that limit at the rates to be determined in accordance with the provision in Clause 12.2 and 12.3 of the tender form. Further, I/we agree that in case of forfeiture of earnest money or both Earnest Money & Performance Guarantee as aforesaid, I/we shall be debarred for participation in the re-tendering process of the work.

I/We hereby declare that I/we shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there from to any person other than a person to whom I/we am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated.....

Signature of the Contractor

Postal Address

Witness.....

Address:

Occupation:

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned here under) Is accepted by me for and on behalf of the President of India for a sum of Rs.....(Rupees.....)

The letters referred to below shall form part of this contract Agreement:

- i)
- II)
- III)

For & on behalf of President of India

Signature-----

Designation-----

Dated-----

SCHEDULES

<u>SCHEDULE 'A'</u>	- Schedule of quantities (Enclosed as Annexure-1)
<u>SCHEDULE 'B'</u>	- Not applicable
<u>SCHEDULE 'C'</u>	- Not applicable
<u>SCHEDULE 'D'</u>	- Not applicable
<u>SCHEDULE 'E'</u>	- Not applicable
<u>SCHEDULE 'F'</u>	

Reference to general conditions of contract

Name of Work: Annual Maintenance Contract of Telemetry System installed in Chambal & Mahanadi Basin

Estimated cost of work: **Rs 46915300/-**
 Earnest Money: **Rs 938306/-**
 Performance Guaranty: 5% of tendered value
 Security Deposit: 5% of tendered value

Officer Inviting Tender: Executive Engineer, Chambal Division, CWC, 84/93-96, Ajay Marg, Pratap Nagar, Sanganer, Jaipur

Maximum percentage for Quantities of items of work to be executed. Beyond which rates are to be determined in accordance with clauses 12.2 & 12.3

Definitions:

2(i) Engineer-in-Charge: Executive Engineer, Chambal Division, CWC, Jaipur for Chambal Basin and Executive Engineer, Mahanadi Division, CWC, Burla for Mahanadi Basin

2(vii) Accepting Authority: Chief Engineer, Yamuna Basin Organisation, Central Water Commission, New Delhi

2(x) Percentage on cost of materials and labour to cover all overheads and profits. NA

2(xi) Standard scheduled of rates NA

2(xii) Department: Central Water Commission

2(xiii) Standard CPWD contract Form: CPWD form8 as amended from time to time.

Clause-1

- | | | |
|-----|---|---------|
| i) | Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance | 15 days |
| ii) | Maximum allowable extension beyond the period above | 7days |

Clause 2 Authority for fixing Compensation under Clause-2	Superintending Engineer, HOC, Noida for Chambal Basin and Superintending Engineer, HOC, Bubneshwar for Mahanadi Basin
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Clause 2A Whether clause 2A shall applicable	NA
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Clause 5 Number of days from the date of issue of letter Of acceptance for reckoning date of start	From 31-07-2011
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Clause 10CC	NA
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Clause 11 Specifications to be followed for Execution of work	Attached at Section III to VI
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Clause 16 Competent Authority for deciding reduced rates.	Superintending Engineer, HOC, Noida for Chambal Basin and Superintending Engineer, HOC, Bubneshwar for Mahanadi Basin
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Clause 36 Minimum qualifications & experience required for Principal Technical Representative	One Graduate and one Diploma required for (Electronics & communication) having suitable experience in handling the telemetry system
i) Recovery to be effected from the Contractor in the event of not fulfilling provision of clause 36	Rs. 20000/- p.m. for Graduate Rs. 15000/- p.m. for diploma holder

SECTION-III

SCOPE OF WORK

3.0 SCOPE OF WORK

The scope of work under this contact shall consist of the following:-

The work shall consist of Annual Maintenance Contract of 53 numbers of remote data acquisition telemetry stations installed in Chambal and Mahanadi basin and two number earth receiving stations (Direct Digital Readout Ground Station-DDRGS) installed at Jaipur & Burla (Orissa) for the total period of three years from the 31-07-2011. Out of the 33 sites installed in Mahanadi Basin, 13 sites are not covered in the existing Annual Maintenance Contract and hence not operational. Therefore, the work shall also include making these 13 sites functional. The details of these sites are given at Annexure-4

The Replacement of equipments installed at Data Acquisition Site (DAS) and Earth Receiving Station(ERS) with latest equipment with upgraded version if repair of defective equipment is not possible or spares are not available. It shall include the maintenance/replacement of parts such as sensors, transmitters, DCP's, Yagi antenna, solar panels, cables etc including operating software's and associated civil works.

The parts/system replaced shall have necessary certification of IMD for use of telemetry stations including satellite transmitter for using satellite network.

3.1 System Description

- (i) Gauging equipment/Sensors
- (ii) Data Collection Units
- iii) Continuous real time data transmission to the earth receiving station (Digital Direct Readout Ground Station-DDRGS) located at Jaipur (Rajasthan) and Burla (Orissa)

The names of the existing remote sites along with the sensors and Earth Receiving Station are given in Annexure-2 to 4. The list of spares available at Jaipur and Burla are given in Annexure-7

SECTION-IV

SPECIAL CONDITIONS OF CONTRACT

4.1 Definition:-

In this contract the following terms shall be interpreted as indicated below:

"The Contract" means the agreement entered into between the Engineer-in-charge and the Contractor as recorded in the Contract Form signed by the parties, including all attachments and appendices there to and all documents incorporated by reference therein.

"The Contract Price" means the price payable to the Contractor under the Contract for the full and proper performance of its contractual obligations for full period of the contract (3 years).

"The Goods" means all of the equipment, machinery and / or other materials which the Contractors are required to supply to the Engineer-in-charge under the contract.

"The Services" means those service ancillary to the supply of the Goods, such as transportation and insurance, and any other incidental services, such as installation, commissioning provision of technical assistance, training and other such obligations of the Contractor covered under the contract.

"Engineer-in-charge" means the organization purchasing the Goods.

"The Contractor" means the individual or firm supplying the Goods and Services under this contract.

"The Project Site" where applicable, means the place or places named in Conditions of Contract.

"Day" means calendar day.

4.2 Country of Origin:

For purpose of this Clause, "Origin" means the place where the Goods were mined, grown, or produced, or from which the services are supplied. Goods are produced when, through manufacturing, processing, or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.

4.2.1 The origin of Goods and Services is distinct from the nationality of the Contractor.

4.3 Standards:

The Goods replaced under this Contract shall conform to the standards mentioned in the Technical Specifications and when no applicable standard is mentioned to the authoritative standards appropriate to the Goods' country of origin. Such standards shall be the latest issued by the concerned institution.

4.4 Use of Contract Documents and Information, Inspection and audit by the Government of India.

The Contractor shall not without the Engineer-in-charge's prior written consent, disclose the contract, or any provision thereof, or any specification, plan drawing, pattern, sample or information furnished by or on behalf of the Engineer-in-charge in connection therewith, to any person other than a person employed by the Contractor in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall be extended only so far as may be necessary for purposes of such performance.

4.4.1 The Contractor shall not, without the Engineer-in-charge's written consent, make use of any document or information enumerated in Clause 4.4 except for purposes of performing the contract.

4.4.2 Any document, other than the contract itself, enumerated in Clause 4.4 shall remain the property of the Engineer-in-charge and shall be returned (all copies) to the Engineer-in-charge on completion of the Contractor's performance under the contract if so required by the Engineer-in-charge.

4.4.3 The Contractor shall permit the authorized representative of the Engineer-in-charge to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by the Engineer-in-charge, if so required by the Engineer-in-charge.

4.4.4 The data collected/transmitted using the system shall remain the sole properties of Engineer-in-charge and shall not be shared with any third party.

4.5 Patent Rights:

The Contractor shall indemnify the Engineer-in-charge against all third party claims of infringement of patent, trade mark, or industrial design rights arising from use of the Goods or any part thereof in the Engineer-in-charge's country.

4.6 Performance Guarantee:

4.6.1 Within Fifteen (15) days of receipt of the notification of Contract award, the successful Contractor shall furnish to the Engineer-in-charge performance guarantee for the amount specified in the Contract.

4.6.2 The proceeds of the performance guarantee shall be payable to the Engineer-in-charge as compensation for any loss resulting from the Contractor's failure to fulfill its obligations under the contract.

4.6.3 The performance guarantee shall be denominated in the currency of the Contract, or in a freely Convertible currency acceptable to the Engineer-in-charge and shall be in one of the following forms:

1. Cash (In case guarantee amount is less than Rs. 10,000/-)
2. Deposit at call Receipt/Banker's Cheque/Demand Draft/ Pay Order of a Scheduled Bank (In case guarantee amount is less than Rs. 1,00,000/-)
3. Government Securities.
4. Fixed Deposit Receipt (FDR) of a scheduled Bank.
5. An Irrevocable Bank Guarantee bond of any scheduled bank or the State Bank of India in the prescribed form given in Annexure.

4.6.4 The performance guarantee shall be discharged by the Engineer-in-charge and returned to the Contractor after completion of the Contractor's performance obligations under the Contract, including any warranty obligations & AMC period, unless specified otherwise in Conditions of Contract.

4.7 Site preparation

The Engineer-in-charge will provide details of the installations sites before the scheduled start of maintenance contract to allow the Contractor to perform a site inspection and assess the requirement.

4.8 Inspection and tests.

- 4.8.1** The Engineer-in-charge or its representative shall have the right to inspect and/ or test the Goods/parts to be replaced to confirm their conformity to the technical specifications. The Engineer-in-charge shall specify what inspections and tests are required and where they are to be conducted. The Engineer-in-charge shall notify the Contractor in writing, in a timely manner, of the identity of any representatives nominated for these purposes.
- 4.8.2** Should any inspected or tested Goods/parts, fail to conform to the specifications, the Engineer-in-charge may reject the Goods/parts and the Contractor shall replace the rejected Goods/parts or make alterations necessary to meet specification requirements free of cost to Engineer-in-charge .
- 4.8.3** The Engineer-in-charge's right to inspect, test and, where necessary, reject the Goods/parts after the goods' arrivals in the Engineer-in-charge's country shall in no way be limited or waived by reason of the Goods/parts having previously been inspected, tested, and passed by the Engineer-in-charge or its representative prior to the Goods/parts shipment from the country of origin. Nothing shall in any way release the Contractor from any warranty or other obligations under this contract.
- 4.8.4** In the event of the hardware and software failing to pass the acceptance test, a period not exceeding two weeks will be given to rectify the defects and clear the acceptance test, failing which the Engineer-in-charge reserves the rights to get the equipment replaced by the Contractor at no extra cost to the Engineer-in-charge.
- 4.8.5** Before the goods and equipment are taken over by the Engineer-in-charge, the Contractor shall supply operation and maintenance manuals together with drawings of the goods and equipment. These shall be in such detail as will enable the Engineer-in-charge 's to operate, adjust and repair all parts of the works as stated in the specifications.
- 4.8.6** The manuals and drawings shall be in the ruling language (English) and in such form and numbers as stated in the contract

4.8.7 Unless and otherwise agreed, the goods and equipment shall not be considered to be complete *for the purpose of taking over* until such manuals and drawings have been supplied to the Engineer-in-charge.

4.8.8 For the system and other software the following will apply:

The Contractor shall provide complete and legal documentation *of hardware*, all subsystems, operating systems, compiler, system software products, whether developed by it or acquired from others. The Contractor shall also indemnify the Engineer-in-charge against any Levies/penalties on account *of any default* in this regard.

4.9 Spare Parts

The Contractor shall carry sufficient inventories to assure *ex-stock supply of Consumables and spares* in the country. Contractor shall ensure the availability *of spares or parts replaced during maintenance contract for a period of at least seven years after expiry of the contract.*

4.10 Warranty

4.10.1 The Contractor warrants that the goods/parts replaced or upgraded under the contract are new, unused, of the most recent or current models and those incorporate all recent improvements in design and materials unless provided otherwise in the contract. The Contractor further warrants that all goods replaced or upgraded under this contract shall have no defect, arising from design, materials or workmanship (except when the design and/ or material is required by the Engineer- in-charge's specifications) or from any act or omission of the Contractor, that may be develop under normal use of the supplied goods in the conditions prevailing in the country of final destination.

4.10.2 The Contractor shall comply with the performance guarantees specified under the contract If, for reasons attributable to the Contractor, these guarantees are not attained in whole or in part, the Contractor shall, make such changes, modifications and/or addition to the goods or any part specified in the contract at its own cost and expense and to carry out further performance tests in accordance with clause-4.8.

4.10.3 The Engineer-in-charge shall promptly notify the Contractor in writing of any claims arising under this warranty.

4.10.4 Upon receipt of such notice, the Contractor shall, with all reasonable speed, repair or replace the defective goods or parts thereof, without cost to the Engineer-In-charge's.

4.11 Training

The Contractor will impart training regarding the various equipment and the technologies to detect the fault in the equipment and on-site maintenance to the officers and staff working under Yamuna Basin Organization and also to the beneficiaries. On-site training/ refresher course in this regard will be conducted in first and third year for a period of 5days for a total of 10 officials. The Contractor shall provide faculty and training kits. All the expenses in this regard excluding TA /DA of the officials of CWC would be borne by the Contractor.

4.12 Upgradation/Replacement

4.12.1The contractor shall replace equipments installed at Data Acquisition Site (DAS) and Earth Receiving Station(ERS) with latest equipment with upgraded version if repair of defective equipment is not possible or spares are not available. It shall include the replacement of parts such as sensors, transmitters, DCP's, Yagi antenna, solar panels, cables etc including operating software's and associated civil works. The replaced part should be compatible with the rest of the system and should not hinder the good functioning of the whole system. Also it should not alter the format of the data to be collected.

4.12.2The goods/parts/sensors replaced/upgraded by the contractor due to non-availability of spares shall have the OEM authorization and Contractor will ensure to supply of such parts/goods/spares for next 10 years. These goods/parts replaced/upgraded by the Contractor should be compatible with the system.

4.12.3 The parts/system replaced by the contractor shall have necessary certification of IMD for use of telemetry stations including satellite transmitter for using satellite network.

4.13 Maintenance Service

- (a) The services to be provided by the Contractor under this contract shall include maintenance, in accordance with the terms and conditions laid down in the contract, of the telemetry equipment / system, all accessories and attachments of the equipments / systems installed at Data Acquisition Sites (DAS) in Chambal and Mahanadi Basin as per the details given in Annexure-2 to 4 and the equipment/ system and the software installed at Data Processing Centre (DPC),Jaipur and Burla as per the details given in Annexure – 2 to 4, including providing of all required consumables, additional spare parts, repair of the defective equipment or units/parts thereof, orientation of antenna whenever required due to any change(s) in position of the satellite and imparting training to the officers of the Central Water Commission about operation and maintenance of telemetry system .
- (b) Contractor shall set up a site office at Jaipur and Burla equipped with all requisite infrastructural facilities at his own cost and notify its office and residential addresses to the Engineer-in-charge, within 15 days from the date of signing this contract.
- (c) Contractor shall provide services of at least one graduate engineers and one diploma engineer to be posted at Jaipur and Burla (at both places), to handle the complaints of the Engineer-in-charge. They should have sufficient experience of working upon and acquaintance with the equipment installed in the Chambal and Mahanadi Basin. One of the Engineers will be dedicated to data processing, validation, data reporting, data editing etc and correction of data at DDRGS centre, Jaipur and Burla. The engineer posted at DDRGS shall put his signature in the attendance register maintained by Engineer-in-charge.
- (d) The list of parameters being measured at various sites is given in Annexure-2 to 4.
- (e) Engineer-in-charge will notify Contractor of any errors and malfunctions, which occur and noticed when equipment are in use, by fax/telephone/e-mail/special messenger directly or through his Service Engineer(s) at his office address during normal working hours or at their residence after normal office hours and/or on holidays. A complaint register will be maintained by Engineer-in-charge at DPC Jaipur and Burla for day to day complaint and it should be signed by contractor or his representative daily for avoiding any confusion regarding the complaint and maintenance of site. The complaint register will be valid record for imposing penalty, if any as per the penalty clauses.

- (f) Contractor shall provide maintenance services to the Engineer-in-charge at data processing centre (DPC), Jaipur and Burla and correct the defect(s) reported by the Engineer-in-charge, within a period of 48 hrs on receipt of the written complaint in the complaint register. However, in case of failure of downconverter, demodulator, receiver, Direct Digital Readout Ground Station and LNA installed at Jaipur/Burla, the contractor shall ensure hourly supply of data from the Earth Receiving Station, Burla/Jaipur through V-sat, internet or any other means of communication without failure, otherwise it will be treated as failure of data processing centre (DPC). Further contractor has to rectify this type of defect within period of 48 Hrs. if spares are available with Engineer-in-charge, otherwise within a period of 3 month on receipt of the written complaint in the complaint register.
- (g) Contractor shall provide maintenance services to the Engineer-in-charge at Data Acquisition Sites (DAS) and correct the defect(s) reported by the Engineer-in-charge, within a period of four days on receipt of the written complaint in the complaint register/fax/e-mail/phone. Contractor shall not be responsible for maintenance of telemetry shed/ telemetry cabin constructed at DAS (Excluding termination block and other accessories directly affecting the Data transmission to DDRGS at Jaipur and Burla).
- (h) The Contractor shall ensure proper functioning of all equipment installed at DAS/ DPC and satisfactory data transmission from all DAS and data receipt at DPC by, utilizing his own spare from his stock for which no additional cost will be paid by the Engineer -in-charge.
- (i) The Contractor shall invariably inform CWC about their visits to telemetry sites. The site in charge of CWC shall be contacted and he will be present during the maintenance visit to telemetry sites by the maintenance personnel of contractor. All activities carried out by contractor during the visit will be recorded in a register maintained at telemetry sites. Manually observed data pertaining to water level, rainfall etc at the time of visit will also be recorded in the register.
- (j) The Contractor shall submit the inspection report duly signed by CWC official after attending the DAS/DPC mentioning the detail of activities carried out by contractor.

- (k) The Contractor shall calibrate the instrument installed at field station at least once in a year before the monsoon and also subsequently if required, in the presence of JE/AE/AEE. The date of inspection/calibration shall be planned in advance and informed to CWC so as to avoid the last minute rush before monsoon.

4.14 PENALTY CLAUSE

Upon receipt of notification of defect in the system from the Engineer-in-charge, if Contractor fails to take immediate corrective measures to rectify the defect, within the stipulated maximum response time stated above, the contractor is liable to pay penalty for unsatisfactory performance of maintenance services, in accordance with the criteria laid down below

4.14.1A Data Acquisition Stations (DAS) continues to remain "fail" for more than the response time specified above at clause-4.13, the contractor shall liable to pay a penalty of Rs 7,000/- per day of delay in each case.

4.14.2A Earth Receiving Station (DDRGS) continues to remain "fail" for more than the response time specified above at clause-4.13, the contractor shall liable to pay a penalty of Rs.20, 000/- per day of delay in each case

4.14.3 If the Contractor fails to calibrate the Data Acquisition Stations (DAS) as per the schedule specified above, the contractor shall liable to pay a penalty of Rs.10000/- per station in each case.

4.14.4 The total penalty shall be limited to 10% value of total contract for three years.

4.14.5 The authority to decide the penalty shall be Superintending Engineer, Hydrological Observation Circle, CWC Noida/Bhubneshwar for their respective basin.

4.15 TERMS OF PAYMENT:

The method and conditions of payment to be made to the supplier under this contract shall be as follows.

- (a) The payment shall be made by Account payee cheque only in Indian Rupees.
- (b) The quarterly payment shall be made to Contractor after the satisfactory completion of work in each 3 month period by respective Engineer-in-Charge.

- (c) Any taxes and/ or other Government levies as applicable or becoming applicable later due to or under any law shall be deducted from the above said amount.
- (d) The contractor shall provide a Bank/Performance Guarantee in the form specified in Annexure-6, in favour of Executive Engineer, Chambal Division, Jaipur/Executive Engineer, Mahanadi Division, Burla for an amount of 5% of the total value of the contract of respective Basin.
- (e) The Security Deposit of 5% of the total running bill amount shall be deducted from each bills of the contractor and the same shall be returned six month after satisfactory completion of contract period.
- (f) The service tax shall be reimbursed to the contractor upon receipt of definite proof of deposition of same with Government of India.

4.16 OTHER TERMS AND CONDITIONS:

(a) Period of Agreement

This contract is for a period of three Years from 31-7-2011.

(b) Renewal of agreement

This agreement could, thereafter, be renewed for successive periods as mutually decided from time to time.

(c) Access to Engineer-in-charge's site/Contractor's office & Records relates to past experience of such equipment in India.

The Engineer-in-charge shall provide free access to the sites where the defect has occurred. (e.g. Remote Station equipment may be under lock & key for which the Engineer-in-charge shall make sure that free access to such sites are made available for necessary actions at contractors end). The Engineer-in-charge will also arrange for the security clearance, wherever required in advance to ensure that contractor's engineers get the access to site immediately.

(d) Consumables

Contractor shall be responsible for, providing & replacement of consumable items including DCP Batteries, Batteries of UPS, cables, tubes, silica gel, connectors and other similar items.

(e) Force Majures

Failures arising out of any circumstance not normal such as damages caused due to fire, theft, riots, accidents, floods (Above HFL) or any other natural calamities and other exceptional circumstances shall be outside the purview of this agreement. However, decision of Engineer-in-Charge about such failures shall be final.

(f) Periodical routine services

Periodical routine services shall be provided by the Contractor in addition to pre-monsoon maintenance to guard against any failure.

(g) Change of Satellite

Changes required for realigning the system at central stations and remote stations due to the change in operating satellite for this project shall be done by the Contractor at his own cost. Equipment required to undertake this change will be arranged by Contractor.

(h) Jurisdiction

All disputes or differences between the Parties to this agreement, meaning or effect of this agreement of the respective rights and liabilities of the parties hereto or their enforcement there under, shall be referred as per the provisions of the Indian Arbitration Act and only the courts in Jaipur(Rajasthan)/ Sambalpur(Orissa) for their respective Basin, shall have jurisdiction in all matters arising out of or connected with this agreement.

(i) Notices

Any notice given by one party to other pursuant to this Contract shall be sent to the other party in writing by registered post or fax confirmed in writing to the other party's address specified in this contract.

(j) Termination for Insolvency

The Engineer-in-charge at any time may terminate the Contract by giving written notice to the Contractor if the Contractor becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Contractor, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the Engineer-in-charge.

(k) Termination for Convenience

The Engineer-in-charge, by written notice sent to the Contractor, may terminate the Contract, in whole or part, at anytime for its convenience. The notice of termination shall specify that termination is for the Engineer-in-charge's convenience, the extent to which performance of the Contractor- under the Contract is terminated, and the date upon which such termination becomes effective.

(l) Termination for Default

The Engineer-in-charge, without prejudice to any other remedy for breach of contract, by written notice of default sent to Contractor, may terminate this contract in whole or in part:

- i) If the Contractor fails to perform any obligation(s) under this contract.
- ii) If the Contractor, in the judgment of the Engineer-in-charge has engaged in corrupt or fraudulent practices in completing for or in executing the contract.

For the purpose of this Clause:

"Corrupt practice" means the offering, giving, receiving or soliciting of any thing of value to influence the action of a public official in contract execution.

"Fraudulent practice" means a misrepresentation of facts in order to influence the execution of contract to the detrimental of the Department.

- (m) If the Contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to complete the work, the Engineer-in-charge may rescind or terminate the contract in whole or part thereof. The Engineer-in-charge shall be free to secure the completion of work by other contractor. The Engineer-in-charge may without prejudice to his any other rights or remedy against the Contractor may recover the cost of expenditure incurred by him in addition to penalty as referred in Clause 4.14 of this contract.
- (n) The Contractor shall be responsible to make good all the damages caused to the building and existing equipment due to negligence.
- (o) In case of termination of contract due to insolvency and for default, the pending works shall be got done by the Engineer-in-charge at the cost of the contractor.

(p) Subcontracts

The Contractor shall notify the Engineer-in-charge in writing of all subcontracts awarded under this contract and this shall not relieve any liability or obligation under the contract to the contractor.

(q) Assignment

The Contractor shall not assign, in whole or any part, its obligations to perform under this contract, to other contractor without prior written permission of the Department

(r) Contractor's Obligations

The Contractor is obliged to work closely with the Department's staff, act within its own authority and abide by directives issued by the Department and implementation agencies.

The Contractor will abide by the job safety measures prevalent in India and will free the Department from all the demands or responsibilities arising from accidents or loss of life the cause of which is the Contractor's negligence. The Contractor will pay all indemnities arising from such incidents and will not hold the Department responsible or obligated.

The contractor is responsible for managing the activities of its personnel or sub-contracted personnel and will hold itself responsible for any misdemeanors.

The Contractor will treat as confidential all data and information about the Department, obtained in the execution of his responsibilities, in strict confidence and will not reveal such information to any other party without the prior written approval of the Department.

4.17 Resolution of disputes:

4.17.1 The Engineer-in-charge and the Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them and or in connection with the Contract.

4.17.2 If, after thirty (30) days from the commencement of such informal negotiations, the Engineer-in-charge and the Contractor have been unable to resolve amicably a Contract dispute, either party may require that the dispute be referred for resolution to the formal mechanisms specified. These mechanisms may include, but are not restricted to, conciliation mediated by a third party, adjudication in an agreed national forum.

4.17.3 Settlement of disputes

The rules of procedure for arbitration proceedings pursuant to settlement of disputes shall be as follows:

- (a)** In case of Dispute or difference arising between the Engineer-in-charge and a domestic Contractor relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of 3 arbitrators one each to be appointed by the Engineer-in-charge and the Supplier. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the President of the Institution of Engineers (India).
- (b)** If one of the parties fails to appoint its arbitrator in pursuance of sub-clause (a) above, within 30 days after receipt of the notice of the appointment of its arbitrator by the other party, then the President of the Institution of Engineers (India), shall appoint the arbitrator. A certified copy of the order of the President of the Institution of Engineers (India), making such an appointment shall be furnished to each of the parties.

- (c) Arbitration proceedings shall be held at Jaipur, India, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.
- (d) The decision of the majority of arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, the expenses incurred by each party in connection with the preparation, presentation etc. of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself.
- (e) Where the value of the contract is Rs. 10 million and below, the disputes or differences arising shall be referred to the Sole Arbitrator. The Sole Arbitrator should be appointed by agreement between the parties; failing such agreement, by the appointing authority namely the: President of the Institution of Engineers (India).

4.18 Governing Language

The Contract shall be written in the English language. The version of the Contract written in the specified language shall govern its interpretation. All correspondence and other documents pertaining to the Contract which are exchanged by the parties shall be written in the same language

4.19 Applicable Law

The contract shall be interpreted in accordance with the law of the Engineer-in-charge's country, unless otherwise specified.

4.20 Notices

- 4.20.1** Any notice given by one party to the other pursuant to this Contract shall be sent to the other party in writing or by cable, telex or facsimile and confirmed in writing to the other party's address specified
- 4.20.2** A notice shall be effective when delivered or on the notice's effective date, whichever is later.

4.20 Taxes and Duties

Supplier shall be entirely responsible for all taxes, duties including import and export duties, license fees etc., incurred until delivery of the contracted Goods to the Engineer-in-charge.

- 4.22** A prospective Bidder requiring any clarification of the Bidding Documents may notify the department in writing, which should reach the Executive Engineer-in-Charge before last date of submission of bids. Written copies of the department's response (including an explanation of the query) will be sent to all prospective bidders and this shall form part of the tender document

- 4.23** At any time prior to the deadline for submission of bids, the department may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder, modify the bidding documents by amendment in writing, which will be binding on all the bidders.
- 4.24** The bid prepared by the Bidder, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the department shall be written in English language. Supporting documents and printed literature furnished by the Bidder may be in another language provided they are accompanied by an accurate translation of the relevant passages in the English language in which case, for purposes of interpretation of the Bid, the translation shall govern.
- 4.25 Fixed price**
- Prices quoted by the Bidder shall be fixed during the validity period of the Contract and not subject to variation on any account. A bid Submitted with an adjustable price quotation is liable to be treated as non-responsive and rejected.
- 4.26** Prices shall be quoted in Indian Rupees only.
- 4.27** Bids from Agents/dealers, without proper authorization from the manufacturer, shall be treated as non-responsive.
- 4.28** Arithmetical errors will be rectified on the following basis.
- (a)** If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected.
- (b)** If there is a discrepancy between words and figures, the amount in words will prevail. If the supplier does not accept the correction of errors, its bids will be rejected.
- 4.29** The department reserves the right to split the work and award the same to more than one tenderer.
- 4.30** The Bidder shall not contact the Department on any matter relating to its bid, from the time of the bid opening to the time the Contract is awarded. If the Bidder wishes to bring additional information to the notice of the Department, it should do so in writing.
- 4.31** The number of stations indicated in schedule of quantities are subject to variation (may increase or decrease) depending upon the actual requirement for which decision of Engineer-in-charge shall be final.
- 4.32** Any corrections / cuttings in the tender document shall be initialed /attested by the bidder.
- 4.33** The Engineer-in-Charge shall facilitate the Contractor for getting the license for import of such equipment as required under the contract as per DoT policy.

However, any financial implication in this regard shall be borne by the Contractor .

4.34 This contract can be terminated at any time with prior written notice to the contractor with one month notice without assigning any reason at the convenience of the department.

SCHEDULE-A

SN	Description	Year-1	Year-2	Year-3
		Amount	Amount	Amount
1	Maintenance of 20 number of Data Acquisition Stations (DAS), Data Processing Center (DPC), Jaipur and Earth Station at Jaipur including associated hardware, software, trainings and civil work installed in Chambal Bain as per various terms and condition of the contract and scope of works.			

Note: The Contractors have to quote their rates excluding of service tax which shall be reimbursed to the contractor upon receipt of definite proof of deposition of same with Government of India

(Seal and Signature of Contractor)

SCHEDULE-B

SN	Description	Year-1	Year-2	Year-3
		Amount	Amount	Amount
1	Maintenance of 33 numbers of Data Acquisition Stations (DAS), Data Processing Center (DPC), Burla and Earth Station at Burla including associated hardware, software, trainings and civil work installed in Mahanadi Bain as per various terms and condition of the contract and scope of works.			
2.	Making functional 13 numbers of Data Acquisition Stations (DAS) out of total 33 sites indicated above as per Annexure-2 to 4, including associated hardware, software and civil work installed in Mahanadi Bain as per various terms and condition of the contract and scope of works. (Lump-sum one time rate may be quoted)			

Note: The Contractors have to quote their rates excluding of service tax which shall be reimbursed to the contractor upon receipt of definite proof of deposition of same with Government of India

(Seal and Signature of Contractor)

ANNEXURE-2-A
DETAILS OF TELEMETRY STATION IN CHAMBAL BASIN

SN	Type of Sites	Name of Sites	River	Type of Sensor	Address/ Location	District	State
1	Type 1A	Barkheda	Chambal	1) Water Level-Direct Bubbler 2) Rainfall- Tipping Bucket	Vill. & P.O.-Barkheda Kalan Teh A lot, Barkheda	Ratlam	M.P.
2		Nagda	Chambal		Right Bank of River Chambal, Khachrod Rd. Nagda	Ujjain	M.P.
3		Pat	Chhoti Kalisindh		Vill. & PO – Pat Teh Tarana, Pat	Ujjain	M.P.
4		Nahargarh*	Siwana		Junior Engr. G&D Site Nahargarh, CWC, Vill. PO Nahargarh	Mandsor	M.P.
5		Tumri*	Retam		Junior Engr. G&D Site Tumri, CWC, Vill. Admliya, The. Malhargarh, Tumri	Mandsor	M.P.
6		Jawahar Sagar Dam	Chambal		Jawahar Sagar Dam	Kota	Rajasthan
7		Mandsour	Siwana		Near Hazi Petrol Pump, Nahargarh Rd., Mandsor	Mandsor	M.P.
8	Type 1B	Badnagar	Chamla	1) Water Level-Bubbler (LOS Radio) 2) Rainfall- Tipping Bucket	Gauging Station, Irrigation Deptt., Chamla River, The. Badnagar, Badnagar	Ujjain	M.P.
9		Dhareri*	Chambal		Junior Engr. G&D Site Dhareri, CWC, Vill. Sarsana, via. Baladi, Dhareri	Ujjain	M.P.
10		Ujjain*	Shipra		Junior Engr. G&D Site, Ujjain, CWC, 153, Jaisingh Pura, Ujjain	Ujjain	M.P.
11	Type 1C	Chaldu	Retam	1) Water Level-Bubbler(Hard	Vill. Chaldu, Teh	Mandsor	M.P.

				Wired Remote) 2) Rainfall- Tipping Bucket	Malhargarh, Chaldu		
12	Type 1E	Rana Pratap Sagar Dam	Chambal	1) Water Level- 2 Bubblers (2 LOS Radio) 2) Rainfall- Tipping Bucket	Rana Pratap Sagar Dam	Chittorgarh	Rajasthan
13	Type 2	Ratlam	Chambal	1)Rainfall- Tipping Bucket	Irrigation Colony, Ratlam	Ratlam	M.P.
14		Dewas	Chhoti Kalisindh		Irrigation Colony, Dewas	Dewas	M.P.
15		Dhar	Chamla		Office of the Executive Engr. Irrigation Deptt. Dhar	Dhar	M.P.
16	Type 2A	Indore**	Shipra	1)Rainfall- Tipping Bucket(AC Power)	Assistant Engr. UCSD, CWC, CGO Complex, 3 rd Floor, Indore	Indore	M.P.
17	Type 3	Gandhi Sagar Dam	Chambal	1) Water Level- 2 Direct Bubblers 2) Rainfall- Tipping Bucket 3) Wind Speed & Wind Direction 4) Solar Radiation	Gandhi Sagar Dam	Mandsor	M.P.
18	Type4	Mahidpur*	Shipra	1) Water Level- Direct Bubbler 2) Rainfall- Tipping Bucket 3) Wind Speed & Wind Direction 4) Solar Radiation 5)Evaporation Pan 6) Air Temperature	Junior Engr. G&D Site Mahidpur, CWC, Chowbe Bhawan, H.No.3, Mahidpur	Ujjain	M.P.
19	Type 8	Tal*	Chambal	1) Water Level- Direct Bubbler 2) Rainfall- Tipping Bucket 3) Evaporation Pan	Site Incharge, G&D Site Tal, CWC, Goshala Rd. Tal	Ratlam	M.P.
20	Type Kota	Kota Barrage**	Chambal	1) Water Level- Bubbler (LOS Radio) 2) Rainfall- Tipping Bucket 3) Evaporation Pan 4) Air Temperature	Assistant Engr. MCSD, CWC, Near Kota Barrage, Kota	Kota	Rajasthan

Note:-

* C.W.C. Sites

** C.W.C. Sub-Division

Remaining sites are M.P.State Government Sites.

DETAILS OF TELEMETRY STATIONS IN CHAMBAL BASIN

S.N.	Name of Sites	River	Type of Sensor	District	State
1	Gandhi Sagar Dam	Chambal	WL,RF,WS,WD,SR	Mandsour	M.P
2	Barkheda	Chambal	WL,RF	Ratlam	M.P
3	Ratlam	Chambal	RF	Ratlam	M.P
4	Tal*	Chambal	WL,RF,EP	Ratlam	M.P
5	Nagda	Chambal	WL,RF	Ratlam	M.P
6	Dhareri*	Chambal	WL,RF	Ujjain	M.P
7	Badnagar	Chamla	WL,RF	Ujjain	M.P
8	Mahidpur*	Shipra	WL,RF,EP,WS,WD,T,SR	Ujjain	M.P
9	Ujjain*	Shipra	WL,RF	Ujjain	M.P
10	Indore**	Shipra	RF	Indore	M.P
11	Pat	Chhotikalisindh	WL,RF	Ujjain	M.P
12	Dewas	Chhotikalisindh	RF	Dewas	M.P
13	Mandsour	Siwana	WL,RF	Mandsour	M.P
14	Chaldu	Retam	WL,RF	Mandsour	M.P
15	R.P.S.Dam	Chambal	WL,RF	Chittorgarh	Rajasthan
16	J.S.Dam	Chambal	WL,RF	Kota	Rajasthan
17	Kota Barrage**	Chambal	WL,RF,EP,T	Kota	Rajasthan
18	Dhar	Chamla	RF	Dhar	M.P.
19	Nahargarh*	Siwana	WL,RF	Mandsour	M.P.
20	Tumri*	Retam	WL,RF	Mandsour	M.P.

Note:-

* C.W.C. Site

** C.W.C. Sub-Division

Remaining Sites are State Government Sites.

WL Water Level Sensor
RF Rainfall Sensor
EP Evaporation Pan Sensor
T Temperature Sensor
WS Wind Speed Sensor
WD Wind Direction Sensor
SR Solar Radiation Sensor

SPECIFICATIONS OF SENSOR INSTALLED IN CHAMBAL BASIN

1. 8210 Data Logger (SUTRON)

Dimensions 12 in. x 10 in. x 6 in. enclosure, molded fiberglass polyester Construction. With quick release latches. (Other enclosures available)

Temperatures -40°C to +60°C Operating

Processor NEC V25 plus, Clock speed 5 MHz

Memory RAM 122K (or 62,000 readings), Expandable to a total of 372K (or 190,000 Readings) in 128K Increments. Battery backed up EPROM 256K Operating System

Battery Backup Lithium Battery storage: 2 years min. (depending on environment)
Back up Life: 1 year min.

Real-Time Clock Accuracy of 1 minute/month

Watchdog Timer System Reset upon microprocessor failure

Sample Intervals 1 sec. to 24 hr. in 1 second increments

Data Retrieval RS-232 Port PCMCIA Memory Card Slot (10 sec download time)

Visual Display 16 character alphanumeric LED

Serial Sensor Connection through RS-232 port (Unit remains programmable through port)

SDI-12 Fully supported through SDI-12 port

Communications Up to THREE (2 internal and 1 external) of the following:

Satellite Radio, LOS Radio, Telephone w/Modem and Speech Synthesis

Power Supply Internal Battery (-0014 and -3014 models only), 6.5 aH @ 12V, operates 8210 for 90 days at 15 minute sampling. Internal charger regulator 1.25 amps max for Solar panel input or DC voltage

Power Quiescent: 600uA

Consumption Typical Avg: 2 mA @ 15 – minute intervals of shaft encoder sample

Digital Inputs Qty 20, under software control,

and Outputs wiring compatible with OPTO-22 equipment. Software Control of switched 12VDC power

Shaft Encoders Switch closure w/quadrature inputs (2 mx.) 3 wire + 12V (4 wire) interface to counters

Tipping Bucker (5 max.) Input Levels: 0-5V

Rain Gauges Switch closure

Counter Inputs Resolution: 16 bits, 5 inputs available

Max. Input Freq. 32 KHz \pm 0.1% w/o rollover
1MHz max. w/rollover

Analog Inputs 8 Standard

Resolution: 13 bits

Accuracy: \pm 0.05% of full scale over temperature range

Input Range: 0-5V Standard

DC Excitation Output: +5V, +12V

Pwr Consumption A/D: 30 mW active

Pressure DC Excitation: \pm 5V Interface

Transducer Differential Input Range: -5V to +100mV

2. Bubbler Water Sensor (SUTRON)

ELECTRICAL

Power Required 8-16 VDC

Control Interface SDI-12

Outputs SDI-12, Quadrature (-3 only), Analog (-4 only)

Current Use -25 mA/24 hrs average
(based on 10 sec. pump on, 15 min. log w/10 ft. head of water)
Quiescent Current < 1mA (-3 & -5) 8 mA (-4)

PNEUMATIC

Pressure Range 0-22 psi
Accuracy 0-10 ft. 0.02% FSO 10-50 ft. 0.1% of reading
Resolution 0.0001 psi
Purge Pressure 35 psi max.
Purge Rate User Programmable
Compressor Type Piston and cylinder compressor

MECHANICAL

Enclosure NEMA-4 fiberglass
Dimensions 12 in. x 15 in. x 7.5 in.
Connections 9 position terminal block
Pressure Outlet 3/8 in. O.D. tubing

ENVIRONMENTAL

Temperature -40°C to +60°C
Humidity 0-95% non-condensing

3. RAIN GAUGE SENSOR (SUTRON)

MECHANICAL Orifice Size 7.87 in. (20 cm) Diameter
Dimensions 8.25 in. (20.95 cm) Dia x 24 in. (609.6 cm) H
Weight 6.4 lbs (2.9 Kg)
Switch Rugged Magnetic Proximity Switch
OPERATIONAL Output 0.1 second switch closure
Accuracy $\pm 0.5\%$ at 0.5 in./hr (1.27 cm/hr.)
 $\pm 2\%$ at 2 in./hr (5.08 cm/hr)
SENSITIVITY/RESOLUTION 0.254MM

4. Evaporation Gauge and Pan (NovaLynx)

Height 27 ½ in. (700mm)
Diameter 8 in. (203mm)
Base 16 in. triangle with leveling screws
Float 4 in. diameter plastic
Cable 50 ft. 3 conductor, 24 AWG, shielded
Output Type Potentiometer
Accuracy 0.25%
Rotation 360° Continuous
Resistance 1000 ohms
Total Resolution 0.03 in. (0.76mm)
Counterweight 4 oz. (114 g) stainless steel
Electrical Angle 340°, $\pm 1^\circ$
Electrical Range 0 to 9.44 in. (0-240mm)
Operating
Temperatures -40°F to 140°F (-40°C to 60°C)
Linearity 0.25%
Mechanical Range 0-10 in. (0-254 mm)
Weight 7 ½ lbs (3.4 kg)
System Accuracy Evaporation gauge with pan & pipes
 $\pm 0.25\%$ over 10 inches

EVAPORATION PAN SPECIFICATIONS

Material Low carbon stainless steel, passivated
After welding
Construction Heliarc welded, ½ in. drain plub
Size 10 in. x 47.5 in. diameter
Weight 48 lbs.

5.0 Air Temperature Sensor (SUTRON)

Range - 50°C to $\pm 50^\circ\text{C}$

Accuracy 0.1°C

Input Voltage 0-5VDC

Maximum Constant

Network Voltage 3.5 VDC

Maximum Constant

Network current 0.7 mA

Dimensions 3/8 in. diameter 4.25 in. length without cable

Output Range 0-3.5 VDC

6.0 Wind Speed/Wind Direction Sensor (RM YOUNG)

WIND SPEED

Range 0-134 mph (0-60m/s)

Gust Survival 220 mph (100 m/s)

Accuracy ± 0.6 mph (± 0.3 m/s)

Threshold Propeller – 2.2 mph (1.0m/s)

Dynamic Response Propeller distance constant (63% recovery) 8.9 ft (2.7m)

Output Magnetically induced AC voltage, shaped to 5 volt square wave, 1800

Rpm (90 Hz) = 19.7 mph (8.8 m/s)

Power Requirement 8 VDC min – 15 VDC max (5mA @ 12 VDC)

7.0 WIND DIRECTION

Range 360° mechanical

355° electrical (5° open)

Accuracy ± 3 degrees

Threshold Vane – 2.4 mph (1.1 m/s)

Vane Delay Distance 50% recovery 4.3 ft (1.3 m)

Damping Ratio 0.3

Nat. Wavelength 24.3 ft. (7.4 m)

Output 10K potentiometer resistance, linearity 0.25%

Power Requirements 15VDC max

Life Expectancy 50 million revolutions

GENERAL SPECIFICATIONS

Overall Height 14.6 in (37 cm)

Length 21.7 in(55 cm)

Weight 2.2 lb. (1 kg)

8.0 Solar Radiation Sensor (KIPP & ZONEN)

Spectral Range 305-2800 nm (50% points)
Sensitivity 9-15uV/W/m²
Impedance 70-100 Ohms
Response Time 99% 55s, 95% 18s
Non-Linearity +/-<1.2% (<1000 W/m²)
Tilt Error +/-<1.0% (<1000 W/m²)
Operating Temp -40°C to 80°C
Temperature Dependence ±2% (-10°C to 40°C)
Maximum Irradiance 2000 W/m²
Directional Error < ± 20 W/m² (Beam 1000 W/m²)
Weight 0.85 kg
Cable Length 10 m
Expected Accuracy +5% for daily sums

9.0 SOLAR PANELS 20 WATT (SOLAREX)

Typical Peak Power 20 Watts
Voltage at Peak Power 17.1 VDC
Current at Peak Power 1.17 A
Minimum Peak Power 20 Watts
Short-Circuit Current 1.27A
Open-Circuit Voltage 20.8 VDC
Dimensions: length 16.63 in. 42.24 cm.
Width 19.75 in. 50.16 cm.
Diameter 1.97 in. 5 cm.
Weight 6.5 lbs. 2.95 kg.

10. YAGI SATELLITE ANTENNA (SUTRON)

ANTENNA TYPE Crossed Yagi
POLARIZATION Right Hand Circular/Left Hand
Circular (field selectable)
GAIN 11.0 dBi
CENTER FREQ. 401. 8 mhZ
3db beamw 47 deg nom.
VSWR 1.5 max
IMPEDANCE 50 Ohms
AXIAL RATIO 5 dB max
LIGHTNING Antenna & elements at DC ground
WIND SURVIVAL 100 Knots
CONNECTOR Type-N Female
TEMPERATURE -55 TO + 65°C
WEIGHT 5 lbs aluminium
8 lbs stainless steel
SIZE 10.5 in. x 10.5 in. x 43.3 in.

**DETAILS OF EQUIPMENTS INSTALLED AT EARTH RECEIVING STATION
AT JAIPUR**

SL No.	Description of Equipments/Software	Quantity
1.	Antenna 3.8 meter	1No.
2.	Feed	1No.
3.	LNA (40 K)	1No.
4.	Synthesized down converter	1No.
5.	DDRGS (2 met! DSR II Digital Signal Receiver)	1No.
6	PC Hardware (DELL Optiplex 320, 80 GB HDD, 1 GB RAM, Intel (R) Pentium (R) 4 CPU 3.20 Ghz, CDR & DVD, 6 USB Ports.	1No.
7.	Sutron X-Connect Software complete (Installed in PC Hardware)	1No.
8.	2000/150 VA / w UPS (220 V AC)	1No.

SPECIFICATIONS FOR SATELLITE EARTH-RECEIVING STATION

General Specifications of Earth Receiving Station

Frequency of Operation:
INSAT 3A :4506.05 MHZ

Specifications of Antenna:

Reflector size : 3.8 Meter Dia.
Reflector type : Solid Fiberglass Material
Mount Design : Polar Mount
Feed Mount : Prime Focus Feed

Specifications of Feed:

Input Frequency : 4.5 to 4.8 GHz
Feed type : Linear

Specifications of LNA: (Single LNA Configuration)

Frequency Range : 4.5 GHz to 4.8 GHz
Noise temp (Amp. 25°C) : <=50oK (45°K typ.)
Gain : >= 60 dB
Gain ripple (over Entire 300 MHz Pass band) : Not more than +/- 0.5 dB
Max. RF input : -50 dBm composite
Max. RF input with no damage : 0 dBm CW in pass band
Operating Temp : -40 to +60°C
Output Port :Type-N
DC Supply : 12 to 28 Volts @ 120mA
Environment : Full weather exposure

Specifications of Synthesized Down converter:

Input to Down converter : 4.5 to 4.8 GHz
IF Output of Down converter : 70 MHz IF
Frequency Sense : Positive (No Spectrum Inversion)
Bandwidth : +/- 20 MHz
Input Level : -80 dBm (typ)
IF Attenuation : 25dB Range (Adjustable)
Output Level : -30 dBm (typ)
Total Conversion Gain : 48 dB (typ)
Spurious and La leakage : <-60 dB (Max)
Image Rejection : >80 dB (90 dB Typ)
Frequency Stability : 1x10-9 per day
Frequency Bandwidth : 1 KHz min
Step Resolution : +/- 20 MHz

DETAILS OF TELEMETRY STATIONS IN MAHANADI BASIN

S.N.	Name of Sites	River/ Tributary	Type of Sensor	District	State
1	Andhiyarkore	Hamp	RF, G	Durg	Chhatisgarh
2	Raipur	Mahanadi	RF	Raipur	Chhatisgarh
3	Rajim	Mahanadi	RF, G	Raipur	Chhatisgarh
4	Sankara	Jonk	RF, G	Mahasmund	Chhatisgarh
5	Simga	Seonath	RF, G	Raipur	Chhatisgarh
6	Baikunthpur	Hasdeo	RF	Koriya	Chhatisgarh
7	Bamnidi	Hasdeo	RF, G	Janjgir	Chhatisgarh
8	Bango Dam	Hasdeo	RF, G&E	Korba	Chhatisgarh
9	Basantpur	Mahanadi	RF, G	Janjgir	Chhatisgarh
10	Ghatora	Arpa	RF, G	Bilaspur	Chhatisgarh
11	Jondhra	Seonath	RF, G	Bilaspur	Chhatisgarh
12	Manendragarh	Hasdeo	RF	Koriya	Chhatisgarh
13	Pendraroad	Arpa	RF	Bilaspur	Chhatisgarh
14	Seorinarayan	Seonath	RF, G, E, SR, T, W	Bilaspur	Chhatisgarh
15	Burla	Mahanadi	RF, E, SR, T	Sambalpur	Orissa
16	Dharamjaigarh	Mand	RF	Raigarh	Chhatisgarh
17	Kantamal	Tel	RF, G	Boudh	Orissa
18	Kelo at Raigarh	Kelo	RF, G	Raigarh	Chhatisgarh
19	Kesinga	Tel	RF, G	Kalahandi	Orissa
20	Khairmal	Mahanadi	RF, G	Boudh	Orissa
21	Kurubhata	Mand	RF, G	Raigarh	Chhatisgarh
22	Paramanpur	Bheden	RF, G	Jharsuguda	Orissa
23	Phulbani	Mahanadi	RF	Kandhamal/Sundargarh	Orissa
24	Salebhata	Ong	RF, G	Balangir	Orissa
25	Sundargarh	lb	RF, G	Sundargarh	Orissa
26	Surajgarh	Mahanadi	RF, G	Raigarh	Chhatisgarh
27	Thethetangar	lb	RF, G	Jashpur	Chhatisgarh
28	Naraj	Mahanadi	RF, G, W	Cuttack	Orissa
29	Tikarapara	Mahanadi	RF, G	Angul	Orissa
30	Ravi Shankar Dam	Mahanadi	RF, G	Dhamtari	Chhatisgarh
31	Dudhawa	Mahanadi	RF	Dhamtari	Chhatisgarh
32	Muramsilli	Sillinala	RF	Dhamtari	Chhatisgarh
33	Hirakud	Mahanadi	G	Sambalpur	Orissa

Note:-

* C.W.C. Site

** C.W.C. Sub-Division

Remaining Sites are State Government Sites.

WL	Water Level Sensor
RF	Rainfall Sensor
EP	Evaporation Pan Sensor
T	Temperature Sensor
WS	Wind Speed Sensor
WD	Wind Direction Sensor
SR	Solar Radiation Sensor

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Rajim

Sl. No.	Name of Instrument	Quantity
1.	Rain Gauge	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	Bubbler Type Option	
a.	Bubbler Water Level System W/150 m tubing	1 No.
3	RTU	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectprs & Cables	1 No.
g.	RTU Software	1 No.
4	DCP Transmitter and Antenna	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
5.	Solar Power Supply and Battery Backup	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
6.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : R S Dam

Sl. No.	Name of Instrument	Quantity
1.	Rain Gauge	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	Bubbler Type Option	
a.	Bubbler Water Level System W/150 m tubing	1 No.
3.	RTU	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectprs & Cables	1 No.
g.	RTU Software	1 No.
4.	DCP Transmitter and Antenna	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
5.	Solar Power Supply and Battery Backup	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
6.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Dudhawa

Sl. No.	Name of Instrument	Quantity
1.	Rain Gauge	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	RTU	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
3.	DCP Transmitter and Antenna	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
4.	Solar Power Supply and Battery Backup	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
5.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Phulbani

Sl. No.	Name of Instrument	Quantity
1.	Rain Gauge	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	RTU	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
3.	DCP Transmitter and Antenna	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
4.	Solar Power Supply and Battery Backup	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
5.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
Site Name : Bango Dam

Sl. No.	Name of Instrument	Quantity
1.	Rain Gauge	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	Bubbler Type Option	
a.	Bubbler Water Level System W/150 m tubing	1 No.
3.	Evaporimeter	
a.	Evaporation Gauge, Includes 50 Meter Cable	1 No.
b.	Evaporation Pan	1 No.
c.	Evaporation Pan Support	1 No.
4.	RTU	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
5.	DCP Transmitter and Antenna	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
6.	Solar Power Supply and Battery Backup	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
7.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Simga

Sl. No.	Name of Instrument	Quantity
1.	Rain Gauge	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	Bubbler Type Option	
a.	Bubbler Water Level System W/150 m tubing	1 No.
3.	RTU	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
4.	DCP Transmitter and Antenna	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
5.	Solar Power Supply and Battery Backup	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cable	1 No.
6.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
 Site Name : Murumsilly

Sl. No.	Name of Instrument	Quantity
1.	Rain Gauge	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	RTU	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
3.	DCP Transmitter and Antenna	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
4.	Solar Power Supply and Battery Backup	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
5.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
 Site Name : Seorinarayan

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
3.	<u>Sun Shine recorder</u>	
a.	Sunshine Duration Sensor W//150 m Cable	1 No.
b.	Sunshine Duration Mounting Hardware	1 No.
4.	<u>Wind Speed & Direction</u>	
a.	Wind sensor-Prop Vane (includes amplifiers)	1 No.
b.	Cable Assy, WS/WD, 50 Meter Cable	1 No.
c.	WS/WD Cross area (Special)	1 No.
d.	Robn 10 Meter Tower W/base, guy kit	1 No.
e.	Lighting Protection Kit, Tower.	1 No.
5.	<u>Evaporimeter</u>	
a.	Evaporation Gauge, Includes 50 Meter Cable	1 No.
b.	Evaporation Pan	1 No.
c.	Evaporation Pan Support	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Raipur

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
Site Name : Baikunthpur

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorder with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Panel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Panel, 20 W unregulated with 50 meter cable	1 No.
9.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
 Site Name : Pendra Road

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
a.	Evaporation Gauge, Includes 50 Meter Cable	
b.	Evaporation Pan	
c.	Evaporation Pan Support	
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
Site Name : Andhiyarkore

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Sankara

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Ghatora

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Jondhra

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
e.	Lighting Protection Kit, Tower.	
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Bamnidih

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
 Site Name : Manendragarh

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Basantpur

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tipping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
c.	WS/WD Cross area (Special)	
d.	Robn 10 Meter Tower W/base, guy kit	
e.	Lighting Protection Kit, Tower.	
c.	Evaporation Pan Support	
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
 Site Name : Dharamjaigarh

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
Site Name : Kurubhata

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
 Site Name : Thetatanger

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
 Site Name : Sundargarh

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi
Site Name : Parmanpur

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Kelo at Raigarh

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Surajgarh

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Salebhata

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
c.	Evaporation Pan Support	
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Kesinga

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Kantamal

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Khairmal

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Tikarpara

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
d.	Robn 10 Meter Tower W/base, guy kit	
e.	Lighting Protection Kit, Tower.	
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	Junction Box.	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Naraj

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
4.	<u>Wind Speed & Direction</u>	
a.	Wind sensor-Prop Vane (includes amplifiers)	
b.	Cable Assy, WS/WD, 50 Meter Cable	
c.	WS/WD Cross area (Special)	
d.	Robn 10 Meter Tower W/base, guy kit	
e.	Lighting Protection Kit, Tower.	
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Burla

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	1 No.
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	1 No.
c.	Rain Gauge Mounting Kit	1 No.
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	
3.	<u>Sun Shine recorder / Air Temperature</u>	
a.	Sunshine Duration Sensor W//150 m Cable	1 No.
b.	Sunshine Duration Mounting Hardware	1 No.
c.	<u>Air temperature sensor with cable</u>	1 No.
4.	<u>Wind Speed & Direction</u>	
a.	Wind sensor-Prop Vane (includes amplifiers)	
b.	Cable Assy, WS/WD, 50 Meter Cable	
c.	WS/WD Cross area (Special)	
d.	Robn 10 Meter Tower W/base, guy kit	
e.	Lighting Protection Kit, Tower.	
5.	<u>Evaporimeter</u>	
a.	Evaporation Gauge, Includes 50 Meter Cable	1 No.
b.	Evaporation Pan	1 No.
c.	Evaporation Pan Support	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	1 No.
c.	Perforated panel, 24 x 20	1 No.
d.	Perforated Panel Mounting Hardware	1 No.
e.	Enclosure Mounting Hardware	1 No.
f.	MS Connectors & Cables	1 No.
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

LIST OF EQUIPMENT INSTALLED AT SITES

Basin Name : Mahanadi

Site Name : Hirakud

Sl. No.	Name of Instrument	Quantity
1.	<u>Rain Gauge</u>	
a.	Raingauge, Tipping Bucket	
b.	Cable Assy, Tapping Bucket, 50 Meter Cable.	
c.	Rain Gauge Mounting Kit	
2.	<u>Bubbler Type Option</u>	
a.	Bubbler Water Level System W/150 m tubing	1 No.
6.	<u>RTU</u>	
a.	8210 Data Recorded with INSAT Transmitter	1 No.
b.	Enclosure Assy, NEMA-4	
c.	Perforated panel, 24 x 20	
d.	Perforated Panel Mounting Hardware	
e.	Enclosure Mounting Hardware	
f.	MS Connectors & Cables	
g.	RTU Software	1 No.
7.	<u>DCP Transmitter and Antenna</u>	
a.	Transmitter included in the above item No.6	1 No.
b.	Antenna, YAGI satellite Stainless Steel	1 No.
c.	Mounting Assembly for 5000-0010-1 (Yagi Antenna)	1 No.
d.	Cable assy, Antenna 50 Meters	1 No.
e.	Protector, Coax	1 No.
f.	Antenna / Solar Pannel Mast 4 meter	1 No.
g.	Mounting Hardware	1 No.
8.	<u>Solar Power Supply and Battery Backup</u>	
a.	Batter, 12V DC, 24 AH	1 No.
b.	Cable Assy, Power, 1 Meter Cable	1 No.
c.	Solar Pannel, 20 W unregulated with 50 meter cabfle	1 No.
9.	<u>Junction Box.</u>	

SPECIFICATIONS OF SENSOR INSTALLED IN MAHANADI BASIN

1. 8210 Data Logger (SUTRON)

Dimensions 12 in. x10 in. x 6 in. enclosure, molded fiberglass polyester Construction. With quick release latches. (Other enclosures available)

Temperatures -40°C to +60°C Operating

Processor NEC V25 plus, Clock speed 5 MHz

Memory RAM 122K (or 62,000 readings), Expandable to a total of 372K (or 190,000 Readings) in 128K Increments. Battery back ked up EPROM 256K Operating System

Battery Backup Lithium Battery storage: 2 years min. (depending on environment)
Back up Life: 1 year min.

Real-Time Clock Accuracy of 1 minute/month

Watchdog Timer System Reset upon microprocessor failure

Sample Intervals 1 sec. to 24 hr. in 1 second increments

Data Retrieval RS-232 Port PCMCIA Memory Card Slot (10 sec download time)

Visual Display 16 character alphanumeric LED

Serial Sensor Connection through RS-232 port (Unit remains programmable through port)

SDI-12 Fully supported through SDI-12 port

Communications Up to THREE (2 internal and 1 external) of the following:

Satellite Radio, LOS Radio, Telephone w/Modem and Speech Synthesis

Power Supply Internal Battery (-0014 and -3014 models only), 6.5 aH @ 12V, operates 8210 for 90 days at 15 minute sampling. Internal charger regulator 1.25 amps max for Solar panel input or DC voltage

Power Quiescent: 600uA

Consumption Typical Avg: 2 mA @ 15 – minute intervals of shaft encoder sample

Digital Inputs Qty 20, under software control,

and Outputs wiring compatible with OPTO-22 equipment. Software Control of switched 12VDC power

Shaft Encoders Switch closure w/quadrature inputs (2 mx.) 3 wire + 12V (4 wire) interface to counters

Tipping Bucker (5 max.) Input Levels: 0-5V

Rain Gauges Switch closure

Counter Inputs Resolution: 16 bits, 5 inputs available

Max. Input Freq. 32 KHz \pm 0.1% w/o rollover
1MHz max. w/rollover

Analog Inputs 8 Standard

Resolution: 13 bits

Accuracy: \pm 0.05% of full scale over temperature range

Input Range: 0-5V Standard

DC Excitation Output: +5V, +12V

Pwr Consumption A/D: 30 mW active

Pressure DC Excitation: \pm 5V Interface

Transducer Differential Input Range: -5V to +100mV

2. Bubbler Water Sensor (SUTRON)

ELECTRICAL

Power Required 8-16 VDC

Control Interface SDI-12
Outputs SDI-12, Quadrature (-3 only), Analog (-4 only)
Current Use -25 mA/24 hrs average
(based on 10 sec. pump on, 15 min. log w/10 ft. head of water)
Quiescent Current < 1mA (-3 & -5) 8 mA (-4)

PNEUMATIC

Pressure Range 0-22 psi
Accuracy 0-10 ft. 0.02% FSO 10-50 ft. 0.1% of reading
Resolution 0.0001 psi
Purge Pressure 35 psi max.
Purge Rate User Programmable
Compressor Type Piston and cylinder compressor

MECHANICAL

Enclosure NEMA-4 fiberglass
Dimensions 12 in. x 15 in. x 7.5 in.
Connections 9 position terminal block
Pressure Outlet 3/8 in. O.D. tubing

ENVIRONMENTAL

Temperature -40°C to +60°C
Humidity 0-95% non-condensing

3. RAIN GAUGE SENSOR (SUTRON)

MECHANICAL Orifice Size 7.87 in. (20 cm) Diameter
Dimensions 8.25 in. (20.95 cm) Dia x 24 in. (609.6 cm) H
Weight 6.4 lbs (2.9 Kg)
Switch Rugged Magnetic Proximity Switch
OPERATIONAL Output 0.1 second switch closure
Accuracy ±0.5% at 0.5 in./hr (1.27 cm/hr.)
±2% at 2 in./hr (5.08 cm/hr)
SENSITIVITY/RESOLUTION 0.254MM

4. Evaporation Gauge and Pan (NovaLynx)

Height 27 ½ in. (700mm)
Diameter 8 in. (203mm)
Base 16 in. triangle with leveling screws
Float 4 in. diameter plastic
Cable 50 ft. 3 conductor, 24 AWG, shielded
Output Type Potentiometer
Accuracy 0.25%
Rotation 360° Continuous
Resistance 1000 ohms
Total Resolution 0.03 in. (0.76mm)
Counterweight 4 oz. (114 g) stainless steel
Electrical Angle 340°, ±1°
Electrical Range 0 to 9.44 in. (0-240mm)
Operating
Temperatures -40°F to 140°F (-40°C to 60°C)
Linearity 0.25%
Mechanical Range 0-10 in. (0-254 mm)
Weight 7 ½ lbs (3.4 kg)
System Accuracy Evaporation gauge with pan & pipes

± 0.25% over 10 inches

EVAPORATION PAN SPECIFICATIONS

Material Low carbon stainless steel, passivated
After welding
Construction Heliarc welded, ½ in. drain plug
Size 10 in. x 47.5 in. diameter
Weight 48 lbs.

5.0 Air Temperature Sensor (SUTRON)

Range - 50°C to ±50°C

Accuracy 0.1°C

Input Voltage 0-5VDC

Maximum Constant

Network Voltage 3.5 VDC

Maximum Constant

Network current 0.7 mA

Dimensions 3/8 in. diameter 4.25 in. length without cable

Output Range 0-3.5 VDC

6.0 Wind Speed/Wind Direction Sensor (RM YOUNG)

WIND SPEED

Range 0-134 mph (0-60m/s)

Gust Survival 220 mph (100 m/s)

Accuracy ± 0.6 mph (±0.3m/s)

Threshold Propeller – 2.2 mph (1.0m/s)

Dynamic Response Propeller distance constant (63% recovery) 8.9 ft (2.7m)

Output Magnetically induced AC voltage, shaped to 5 volt square wave, 1800

Rpm (90 Hz) = 19.7 mph (8.8 m/s)

Power Requirement 8 VDC min – 15 VDC max (5mA @ 12 VDC)

7.0 WIND DIRECTION

Range 360° mechanical

355° electrical (5° open)

Accuracy ± 3 degrees

Threshold Vane – 2.4 mph (1.1 m/s)

Vane Delay Distance 50% recovery 4.3 ft (1.3 m)

Damping Ratio 0.3

Nat. Wavelength 24.3 ft. (7.4 m)

Output 10K potentiometer resistance, linearity 0.25%

Power Requirements 15VDC max

Life Expectancy 50 million revolutions

GENERAL SPECIFICATIONS

Overall Height 14.6 in (37 cm)

Length 21.7 in (55 cm)

Weight 2.2 lb. (1 kg)

8.0 Solar Radiation Sensor (KIPP & ZONEN)

Spectral Range 305-2800 nm (50% points)
Sensitivity 9-15uV/W/m²
Impedance 70-100 Ohms
Response Time 99% 55s, 95% 18s
Non-Linearity +/-<1.2% (<1000 W/m²)
Tilt Error +/-<1.0% (<1000 W/m²)
Operating Temp -40°C to 80°C
Temperature Dependence ±2% (-10°C to 40°C)
Maximum Irradiance 2000 W/m²
Directional Error < ± 20 W/m² (Beam 1000 W/m²)
Weight 0.85 kg
Cable Length 10 m
Expected Accuracy +5% for daily sums

9.0 SOLAR PANELS 20 WATT (SOLAREX)

Typical Peak Power 20 Watts
Voltage at Peak Power 17.1 VDC
Current at Peak Power 1.17 A
Minimum Peak Power 20 Watts
Short-Circuit Current 1.27A
Open-Circuit Voltage 20.8 VDC
Dimensions: length 16.63 in. 42.24 cm.
Width 19.75 in. 50.16 cm.
Diameter 1.97 in. 5 cm.
Weight 6.5 lbs. 2.95 kg.

10. YAGI SATELLITE ANTENNA (SUTRON)

ANTENNA TYPE Crossed Yagi
POLARIZATION Right Hand Circular/Left Hand
Circular (field selectable)
GAIN 11.0 dBi
CENTER FREQ. 401. 8 mhZ
3db beam w 47 deg nom.
VSWR 1.5 max
IMPEDANCE 50 Ohms
AXIAL RATIO 5 dB max
LIGHTNING Antenna & elements at DC ground
WIND SURVIVAL 100 Knots
CONNECTOR Type-N Female
TEMPERATURE -55 TO + 65°C
WEIGHT 5 lbs aluminium
8 lbs stainless steel
SIZE 10.5 in. x 10.5 in. x 43.3 in.

**DETAILS OF EQUIPMENTS INSTALLED AT EARTH RECEIVING STATION AT
BURLA**

SL No.	Description of Equipments/Software	Quantity
1.	Antenna 3.8 meter	1No.
2.	Feed	1No.
3.	LNA (40 K)	1No.
4.	Synthesized down converter	1No.
5.	DDRGS (2 met! DSR II Digital Signal Receiver)	1No.
6	PC Hardware (DELL Optiplex 320, 80 GB HDD, 1 GB RAM, Intel (R) Pentium (R) 4 CPU 3.20 Ghz, CDR & DVD, 6 USB Ports.	1No.
7.	Sutron X-Connect Software complete (Installed in PC Hardware)	1No.
8.	2000/150 VA / w UPS (220 V AC)	1No.

SPECIFICATIONS FOR SATELLITE EARTH-RECEIVING STATION

General Specifications of Earth Receiving Station

Frequency of Operation:
INSAT 3A :4506.05 MHZ

Specifications of Antenna:

Reflector size : 3.8 Meter Dia.
Reflector type : Solid Fiberglass Material
Mount Design : Polar Mount
Feed Mount : Prime Focus Feed

Specifications of Feed:

Input Frequency : 4.5 to 4.8 GHz
Feed type : Linear

Specifications of LNA: (Single LNA Configuration)

Frequency Range : 4.5 GHz to 4.8 GHz
Noise temp (Amp. 25°C) : <=50oK (45°K typ.)
Gain : >= 60 dB
Gain ripple (over Entire 300 MHz Pass band) : Not more than +/- 0.5 dB
Max. RF input : -50 dBm composite
Max. RF input with no damage : 0 dBm CW in pass band
Operating Temp : -40 to +60°C
Output Port :Type-N
DC Supply : 12 to 28 Volts @ 120mA
Environment : Full weather exposure

Specifications of Synthesized Down converter:

Input to Down converter : 4.5 to 4.8 GHz
IF Output of Down converter : 70 MHz IF
Frequency Sense : Positive (No Spectrum Inversion)
Bandwidth : +/- 20 MHz
Input Level : -80 dBm (typ)
IF Attenuation : 25dB Range (Adjustable)
Output Level : -30 dBm (typ)
Total Conversion Gain : 48 dB (typ)
Spurious and La leakage : <-60 dB (Max)
Image Rejection : >80 dB (90 dB Typ)
Frequency Stability : 1x10-9 per day
Frequency Bandwidth : 1 KHz min
Step Resolution : +/- 20 MHz

LIST OF STATION INSTALLED IN MAHANADI BASIN WHICH ARE TO BE MAKE FUNCTIONAL

SN	Name of Site	Name of River/Tributary	Type of Site/Sensor Installed
1	Andhiyarkore	Hamp	RF,G
2	Raipur	Kharun	RF
3	Jondhra	Seonath	RF,G
4	Pendra road	Hasdeo	RF
5	Baikunthpur	Hasdeo	RF
6	Manendragarh	Hasdeo	RF
7	Dharamjaygarh	Mand	RF
8	Surajgarh	Mahanadi	RF,G
9	Kantamal	Tel	RF,G
10	Phulbani	Mahanadi	RF
11	Dudhuwa	Dudhuwa	RF
12	Murumsilli	Silli	RF
13	Hirakud	Mahanadi	G

RF : Rainfall Site

G : Gauge site

FORMAT OF DATA TO BE RECEIVED AT DDRGS

11032909 - WordPad													
File Edit View Insert Format Help													
AAABE039411088090000G46-7NN135INNO0147:T 03 :C1 0000 :C2 0511 :C3 1023 :H 0000 :0 1023 :1 0005 :2 0000 :3 0000 :4 0000 :5 0000 :6 0000 :7 0000													
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FORMAT OF DATA TO BE RECEIVED AT DDRGS

The screenshot shows the XC DataView application window. On the left, there is a tree view of stations under the 'XC_ORACLE' data source. The main area displays a 'Data Retrieval' table with the following columns: StationID, SensorName, and LastUpdate. Below this, a large data table is shown with columns for Date/Time and various sensors (BATTERY, EVAP, RAIN, SOLAR, TEMP, WINDDIR, WINDSPD, WLEVEL) at the MAHIDPUR station. The data spans from 03/28/11 09:00:00 to 03/29/11 13:00:00. On the right side, there are controls for data retrieval, including 'From' and 'To' date/time pickers, a 'Retrieve' button, and a 'Clear' button. Below these are options for 'Edit Mode' (Edit, Batch), 'Interval' (set to 1 Hour), 'Day' (radio buttons for mon, tue, wed, thu, fri, sat, sun), 'Hour' (Offset: 0), 'Minute' (Offset: 0), and 'Approx Times' (Enable checkbox, +/- (min): 0). A 'Stats' button is also present.

Date/Time	MAHIDPUR BATTERY	MAHIDPUR EVAP	MAHIDPUR RAIN	MAHIDPUR SOLAR	MAHIDPUR TEMP	MAHIDPUR WINDDIR	MAHIDPUR WINDSPD	MAHIDPUR WLEVEL
03/28/11 09:00:00	12.7	65.7	0.0	458	27.9	245	1.1	447.052
03/28/11 10:00:00	12.9	65.7	0.0	696	32.8	301	8.1	447.052
03/28/11 11:00:00	13.0	65.2	0.0	822	34.1	262	14.9	447.052
03/28/11 12:00:00	13.0	64.5	0.0	891	34.6	260	17.8	447.052
03/28/11 13:00:00	12.8	63.6	0.0	911	34.9	259	19.4	447.052
03/28/11 14:00:00	12.7	62.4	0.0	888	35.3	254	16.3	447.052
03/28/11 15:00:00	12.7	61.2	0.0	763	35.7	272	18.9	447.052
03/28/11 16:00:00	12.5	60.3	0.0	545	35.5	234	17.0	447.052
03/28/11 17:00:00	12.5	59.6	0.0	317	35.1	244	13.8	447.052
03/28/11 18:00:00	12.5	58.7	0.0	110	34.2	254	15.2	447.052
03/28/11 19:00:00	12.5	58.4	0.0	0	31.9	258	9.9	447.052
03/28/11 20:00:00	12.5	58.2	0.0	0	28.9	235	5.8	447.052
03/28/11 21:00:00	12.4	57.9	0.0	0	27.1	213	4.8	447.052
03/28/11 22:00:00	12.4	57.7	0.0	0	25.2	189	5.5	447.052
03/28/11 23:00:00	12.3	57.7	0.0	0	23.6	195	4.2	447.052
03/29/11 00:00:00	12.4	57.5	0.0	3	23.1	185	3.8	447.052
03/29/11 01:00:00	12.3	57.5	0.0	0	22.3	185	4.5	447.052
03/29/11 02:00:00	12.3	57.2	0.0	0	21.5	195	4.1	447.052
03/29/11 03:00:00	12.4	57.0	0.0	0	21.0	210	3.1	447.052
03/29/11 04:00:00	12.4	57.0	0.0	0	23.9	235	6.4	447.052
03/29/11 05:00:00	12.3	57.0	0.0	0	21.2	191	3.8	447.052
03/29/11 06:00:00	12.4	57.0	0.0	0	19.6	189	3.6	447.052
03/29/11 07:00:00	12.3	57.0	0.0	61	19.8	189	4.5	447.052
03/29/11 08:00:00	12.4	56.8	0.0	210	23.6	209	5.9	447.052
03/29/11 09:00:00	12.7	56.5	0.0	474	29.0	234	7.4	447.052
03/29/11 10:00:00	12.9	56.3	0.0	722	31.3	252	14.1	447.052
03/29/11 11:00:00	12.9	55.8	0.0	860	32.9	253	18.1	447.052
03/29/11 12:00:00	11.7	54.9	0.0	906	34.1	259	16.1	447.052
03/29/11 13:00:00								

Form of Performance guarantee / Bank guarantee bond

In consideration of the President of India (hereinafter called "The Government") having offered to accept the terms and conditions of the proposed agreement betweenand..... (hereinafter called "the said contractor(s)" for the work (hereinafter called "the said agreement") having agreed to production of an irrevocable Bank Guarantee for Rs.....(Rupees.....only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

1. We.....(hereinafter referred to as the "Bank") hereby undertake to (indicate the name of the Bank) pay to the Government an amount not exceeding Rs.....(Rupees.....only) on demand by the Government.
2. We.....do hereby undertake to pay the amounts due and payable (indicate the name of the Bank) under this Guarantee without any demur, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding Rs..... (Rupees..... only).
3. We, the said Bank, further undertake to pay to the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder, and the contractor(s) shall have no claim against us for making such payment.
4. We..... further agree that the Guarantee herein contained shall (indicate the name of the Bank) remain in full force and effect during the period that would be taken for the performance of the said agreement, and it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid, and its claims satisfied or discharged, or till the Engineer-in-charge, on behalf of the Government, certifies that the terms and conditions of the said agreement have been fully and properly carried out by the' said contractor(s), and accordingly discharges this guarantee.
5. We ,further agree with the Government that the Government (indicate the name of the Bank) shall have the fullest liberty without our consent, and without effecting in any manner OUI' obligations hereunder, to vary any of the terms and conditions of the said agreement or to extend time of performance by the said contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor(s) , and to forbear or enforce any of the terms and conditions relating to the said agreement, and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said contractor(s) or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to-the said contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.
6. This Guarantee will not be discharged due to the change in the constitution of the Bank or the contractor(s).
7. We..... lastly undertake not to revoke this Guarantee except with (indicate the name of the Bank) the previous consent of the Government in writing.
8. This Guarantee shall be valid up to.....unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this Guarantee is restricted to Rs.....(Rupees.....only), and unless a claim in writing is lodged with us within six months of the date of expiry or extended date of expiry of this Guarantee all our liabilities under this Guarantee shall stand discharged.

Dated the..... day of For.....

(Indicate the name of the Bank)

List of Telemetry Spares Available at Jaipur for Chambal Basin

S.No.	Description of Equipments/ Softwares	Quantity
1.	Rain Gauge (Tipping Bucket)	3 Nos.
2.	Wireless Radio Transmitter	3 Nos.
3.	Bubbler	1 No.
4.	Sunshine duration sensor	1 No.
5.	Air Temperature sensor with 50 m cable	1 No.
6.	Wind Sensor- Prop Vane (includes Amplifiers)	1 No.
7.	Evaporation Gauge	1 No.
8.	8210 Data Recorder with Transmitter	1 No.
9.	Antenna, Yagi	2 Nos.
10.	Solar Panel 20 W unregulated	1 No.
11.	LNA (40 K)	1 No.
12.	Satlink-2	1 No.

List of Telemetry Spares Available at Burla for Mahanadi Basin

S.No.	Description of Equipments/ Softwares	Quantity
1.	Rain Gauge (Tipping Bucket)	5 Nos.
2.	Wireless Radio Transmitter	-
3.	Wireless Radio Receiver	-
4.	Bubbler Water Level system with 150 m tubing	3 Nos.
5.	Sunshine duration sensor with 50 m cable	1 No.
6.	Air Temperature sensor with 50 m cable	1 No.
7.	Wind Sensor	1 No.
8.	Evaporation Gauge with 50 m cable	1 No.
9.	8210 Data Recorder with Insat Transmitter	3 No.s
10.	Antenna, Yagi Satellite	6 Nos.
11.	Solar Panel 20 W with 5 m cable & mounting bracket	6 Nos.
12.	LNA (40 K)	1 No.
13.	Communication cable	30 m