



GOVERNMENT OF ODISHA
DEPARTMENT OF WATER RESOURCES

ANNUAL REPORT 2016-17

UPPER KOLAB HEAD WORKS DIVISION
KOLABNAGAR

Executive Engineer
Upper Kolab Head Works Division
Kolabnagar

SALIENT FEATURES OF UPPER KOLAB PROJECT

GENERAL DATA

1.	District	Koraput
2.	Tahasil	Jeypore, Borigumma, Kotpad, Kundra
3.	River	Kolab
4.	Location of Head works	16 Km. upstream of Jeypore Town
5.	Name of River/Basin	Kolab
6.	Longitude	82.36 East
7.	Latitude	19.10 North

HYDROLOGICAL DATA OF MAIN DAM

1.	Catchment area	1630 Sqkm.
2.	Rainfall in command	
(a)	Maximum annual rainfall	1560 mm
(b)	Minimum annual rainfall	980 mm
(c)	Mean annual rainfall	1270 mm
(d)	80% chance annual rainfall	1016 mm
3.	Annual runoff (Average)	1704 M.Cum
4.	Reservoir	
a)	Storage (in Mcum)	

	As per original project report (1975)	Revised as per CWC , New Delhi(2011)
Gross storage capacity	1215	1073.95
Dead storage	280	214.76
Live storage	935	859.19

b) Elevations Original/Revised
(Upper Kolab System)

i.	Maximum water level	858.00 M
ii.	Full reservoir level	858.00 M
iii.	Lowest Reservoir level	837.00 M
iv.	Dead storage level	844.00 M
v.	River bed level	837.00 M

5. Dam & Spillway

Length	646.00 M.
Maximum height	55.00 M.
Overflow Length	169.20 M.
No. & size of gates	11Nos.X (12.20 X 12.20)M. Radial type
Spillway crest level	845.800 M.
Original Design Flood (as per project report)	10020 Cumecs
Revised Design Flood (as per CWC, New Delhi)	12569 Cumecs

6. Dyke

Length	526.00 M.
Maximum height	7.00 M.

WATER CONDUCTOR SYSTEM

1. MAIN TUNNEL INTAKE

i. Diameter –	6.00 M finished horse shoe type
ii. Top Level of Platform -	847.000 M
iii. No. of trash rack bays -	7 Nos.
iv. Intake bed level	827.800M
v. Tunnel central line level -	830.800 M
vi. Bell Mouth Top level	837.000 M

2. SURGE TANK

i. Surge Tank (simple type)	15.00 M dia depth 145.00 M
ii. Bottom Level of Surge tank	765.500 M
iii. Top Level of surge tank	910.00M
iv. Minimum Surge level	812.00M
v. Maximum Surge level	880.00M

3. PENSTOCK TUNNEL

i. Nos. & Length	2 Nos. & 391 M respectively
ii. Diameter	5 M finished steel lined

4. PENSTOCK

i. Nos. & Length	4 nos. & 537 M respectively
ii. Diameter	3.50 M

5. POWER HOUSE

i.	No. of units	4units of 80 MW each
ii.	Service bay floor level	598.500M
iii.	Generator Floor level	593.700 M
iv.	Deepest foundation level	576.450M
v.	Maximum Tail water level	595.200 M
vi.	Minimum Tail water level	587.680 M
vii	Turbines Vertical Shaft	Francis Type (428.6 rpm) 92000 KW capacity
viii	Generator	80 MW at 0.9 pf 50 cycles , 3 Phase star connected normal speed 428.6 rpm
ix	Rated net head & design net head	261.730M
x	Firm output at 100 % load factor	95 MW
xi	Bed width of tail race channel	25.00 M
xii	Length of tail race channel	900M

SATIGUDA DAM

TBL	597.200 M
MWL	595.200 M
FRL	593.500 M
DSL	587.680 M
Spillway Crest Level	591.800 M
Total length of Dam	1144.150 M
Water spread area at FRL	56.70 Ha.
No. of gates in spillway	03
Maximum Discharge in spillway	434 Cumecs
Inflow Design Flood (Revised Hydrology)	479 Cumecs
Maximum Outflow (Revised Hydrology)	413.510 Cumecs
D/S cistern level	575.000 M
B.L. of Exit channel	580.360 M
Live Pondage of reservoir	1519.000 T.Cum
Gross Pondage of reservoir	1746.000 T. Cum
Gallery in spillway section	1.50 X 2.10 M
Length of gallery	61.50 M
Top width of dam	8.00 M
Maximum Height of Dam	16.84 M (Homogeneous)
<u>H.R.of J.M.C.</u>	
Gates	6 Nos. X 2.75 M X 2.75 M Service side 6 Nos. X 2.75 M X 2.75 M Emergency side
Sill Level of Gates	584.600 M
J.M.C. Bed Width (on D/S of H.R)	8.50 M
F.S.L.	587.300 M
B.L	583.300 M

F.S.D.	4.00 M
Full Supply Discharge	98.100 Cumecs
<u>H.R.of Padmapur Distributory</u>	
Gates	2 Nos. X 1.50 M X 1.00 M Service side 2 Nos. X 1.50 MX 1.00 M Emergency side
Bed Width of canal	6.00 M
F.S.L.	587.100 M
B.L.	586.300 M
F.S.D.	0.80 M
Full Supply Discharge	2.70 Cumec

CANAL SYSTEM

a) Canal lengths

Name of canal	Length (In Km.)
Jeypore Main Canal	17.85
Branch Canal	5.136
Distributories	64.188
Minors	71.829
Sub-Minors	<u>86.50</u>
Total length	245.503

(b) Area in (Ha.)

Culturable Command Area

1 Jeypore main canal	2371.91Ha
2 Padmapur Distributarysystem	1455.745Ha
3.D.B.C System	6795.776Ha
Total	10623.431Ha

Intensity of Irrigation	100% in Khariff 83 % in Rabi
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U.K.H.W.DIVISION AT A GLANCE

The head quarter of this division is located at Kolabnagar and is responsible for the operation and maintenance of Main Dam, Satiguda Dam, water conductor system and some of the portions of distribution system .

Total length of Jeypore Main Canal of U.K.P is 58.83 km. & ayacut area is 44500 Ha. Out of this Upper Kolab Head works division comprises jurisdiction Jeypore Main Canal from 00 to R.D 17.854 km. With 5 nos of distributaries and it's off taking channels.

Out of the total ayacut area this Upper Kolab Head Works Division, Kolabnagar has an ayacut area of **10623.431 Ha.** having the following jurisdiction and below mentioned system features for operation & maintenance.

1. Upper Kolab Gravity Dam and its components like gate system, Intake structure, Surge shaft and transmission tunnel.
2. Satiguda earth dam for the balancing reservoir for irrigation and water supply to Jeypore Town.
3. Jeypore Main Canal from R.D. 00 to 17.850 Km along with its off- takings canals.
4. Padmapur Distributary system from RD 00 to 12.660 km. along with its off-taking canals.
5. Maintenance of three different colonies at Kolabnagar and part of LA&RO colony at Koraput.

Capacity Enhancement of Satiguda reservoir

It is highly essential to enhance the capacity of Satiguda reservoir in order to meet the irrigation demand during the critical periods. As the gross storage capacity of the reservoir is only 1.710 MCum at FRL condition and there is fluctuation of generation schedule and subsequent water level, the irrigation demand for the present ayacut potential of 44500 Ha. can not be met out of the reservoir. During the peak hours of the power generation, it is frequently needed for forced spilling of water through the spillway and also causes an empty reservoir, if the power generation would not be made for a mere 8 hours or so.

The depletion of the reservoir because of the less storage capacity and requirement of canal discharge, often cause much hue and cry and damage the standing crops during the irrigation seasons, especially at the tail ends. Also due to the falling reservoir level it is not possible to make the water supply to Jeypore Town and to the Irrigation colony at Bariniput. The local farmers and people of jeypore town often demand for the regular way of water discharge.

So, a proposal for the capacity enhancement has been submitted to Engineer-in – Chief, Water Resources vide Lr. No. 1484(WE) / Dt- 10-3-2015 to put forth before the TAC for kind consideration. Accordingly, a high level meeting was convened by the Engineer-in-chief- cum- Special Secretary to Govt., DOWR on Dt- 28-4-2015 to evaluate the

necessity of capacity enhancement. Now, the matter is under active consideration of Chief Engineer, PPF, Bhubaneswar.

1. **Revival of Gates for Intake structure of Tunnel**

The gates for the head race tunnel intake of the project are not functional because of the missing motors and hoisting mechanism. Efforts are now being initiated for the restoration of all the sluice valves for smooth operation of the intake gates and surge shaft gates in the transmission system or to close the tunnel at the time of exigency like natural disaster or anti-social activities.

In this regard , a high level team inspected the sites and accordingly the work has been awarded to M/S O.C.C amounting to **Rs. 5.26 crore** for the restoration works of all the defunct gates at Intake and Gate Shaft of water conductor system with date of commencement and stipulated date of completion as 22.10.2016 & 21.2.2018 respectively

KHARIFF & RABI IRRIGATION PROGRAMMED & ACHIEVEMENT

Ayacut Area in Ha

Name of Block	Khariff Irrigation 2016 (Ha)		Rabi Irrigation 2016-17 (Ha)		
	Programmed	Achievement	Programmed	Achievement	
Jeypore	10623.431	10202.546	9571.923.00		

STATUS OF PANIPANCHAYAT

- 1) No.of Panipanchayats constituted under U.K.H.W. Division = 25
- 2) Nos. . of Distributory committees = 02
- 3) The Election for Dhanpur Branch Canal Distributory Committee has been completed on 04..10.2016 .
- 4) Steps are being taken to conduct the election for 3 nos of Pani Panchayats under Padmapur Distributory Committee after which the election for Padmapur Distributory Committee will be Conducted.

WORK STATUS:-.

STATUS OF ALLOTTMENT Vs. EXPENDITURE ON WORKS DURING 2015-16 (ENDING 31.3.2017)					
U.K.HEAD WORKS DIVISION, KOLABNAGAR					
Amount in thousand rupees					
SI NO	Name of the Sub Head	Amount of allotment	Expenditure upto end of 03/2017	% Expenditure incurred	Remarks
1	20-2700-12-101-0239-21033-000-0-1-0--MAINTENANCE WORK	23800	23798.393	99.99	2
2	20-2700-12-101-0239-21073-000-0-1-0--SPL.REPAIR	4600	4599.653	99.99	
3	20-2700-12-101-0239-21072-000-0-1-0—SPI REPAIR FOR GATE WORKS	4500	721.00	16.02	
4	20-2700-12-101-0239-21003-000-0-1-0-Electricity Consumption	5500	5395.54	98.10	
5	20-2700-12-101-0239-21111-000-0-1-0--MAINTENANCEOF RES.BLDGS.	500	365.34	73.07	
6	20-2700-12-101-0239-21112-000-0-1-0--MAINTENANCE OF NON-RES.BLDGS.	500	449.881	89.98	
7	20-2700-12-101-0239-32006-000-0-1-0--M&E	200	134.86	67.43	
8	20-2700-12-101-0239-31003-000-0-1-0--T&P	500	208.838	41.77	
9	20-2700-12-101-0239-08001-397-0-1-0--M&V	600	302.753	50.46	
+999+	20-2700-80-800-1848-21033-000-0-1-0--MAINTENANCE OF CRITICAL WORKS	19600	195.779	99.92	
11	20-2700-80-800-1730-21028-000-0-1-0-- MAINTENANCE of Roads	1400	1383.80	98.84	

12	20-3054-80-800-2450-21033-000-0-1-0-- MAINTENANCE OF ROADS.& BRIDGES	3600	2724.80	75.69	
13	DRIP WORKS (U.K.DAM &SATIGUDA DAM)	82566	82563.11	99.996	
	GRAND TOTAL	147866	139153.84	94.108	

1 MAINTENANCE WORKS FOR CANAL:

Out of the allotment placed under Maintenance work and Special repair, a number of restoration works like removal of silt, structural repair ,canal bank strengthening, repair to service roads were executed, as a result irrigation water reached safely to the tail end s of canals.

2. WORKS TAKEN UP UNDER CRITICAL MAINTENANCE GRANT:

The list of the works taken up out of the allotment placed under critical maitenance grant are reflected below.

Sl no	Name of work	Agreement No	Expenditure incurred by 31.3.2017
1	Improvement of periphery road connecting Satiguda Dam and Power House U.K.Project.	06p1/16-17	2000647
2	Construction of guard wall and removal of slipped earth on right side from RD0.300 to 0.500KM of Dhanpur Distributary	13p1/16-17	827003
3	Repair & painting of parapet of Roads strips of slope packing & guard wall of garden U.K. Dam.	17p1/16-17	407472
4	Road connection of service bank from RD 9100 mtr to 9300 mtr of Padmapur Distributary including protection works	18p1/16-17	833993
5	Renovation of canal section including protection work, CC Lining and structure repair from RD 520m to 2300m and 6787m to 6887m of Jeypore Distributary.	19p1/16-17	1866804
6	Development of Bed including maintanance to Terraced Garden No.II at right side of U.K. Dam.	21p1/16-17	43041
7	Supplying & fixing of SS Garden poles with top lanterns at Garden No.I,II,III & Children Park of U.K.Dam	23p1/16-17	782071
8	Reconstruction of side protection wall on left side at disturbed portions & removal of sheet rock from the waterway of Spillway of Satiguda Dam	25p1/16-17	2643669
9	Renovation of canal section including Bank strengthening protection work,bed clearance of JMC within RD 10.00Km TO 13.460 Km	26p1/16-17	1116300
10	Supplying & fixing of SS Hand Railing at Garden No.I & II at right side of U.K.Dam	36P1/16-17	559299

11	Special repair to cross drainage work at RD 9240 m of Padmapur Disty	37P1/16-17	1688091
12	Fixing of display board at Ghatagumar junction to UK Dam at NH 43	38P1/16-17	109331
13	Construction of 07 nos opf umbrella shape with sitout at Picnicspot	39P1/16-17	150853
14	Construction of Platform around trees in Picnic Spot.	42P1/16-23	436892
15	Repair & painting of parapet, Guard Wall & Drains along the road from Gtagumar to Bhutanagar	43P1/16-24	585313
16	Improvemnt to erraced Garden No-IV at right side of UKDam	44P1/16-17	444211
17	Avenue plantation work from Ghatgumar to Damsite	47P1/16-17	216240
18	Improvement to children park at U.K. Dam.	48P1/16-17	476889
19	Constuction of 02 nos Stall near Dam top and terraced grden no-IV	55P1/16-17	437367
20	Repair of generator room at entrance of gallery at right flank of UK Dam.	33F2/16-17	77897
21	Repairing of old parapet walls of Satiguda Dam between Right end to Head Regulator Structure, JMC including painting works.	45F2/16-17	92480
22	Supplying, Fixing of M.S. Grill Gates for entrance of Sub-Division and cover to the DG set at Satiguda Dam.	46F2/16-17	89442

3. LIST OF WORKS TAKEN UP UNDER 20-3054 Maintanance of Roads and Bridges.:

Sl no	Name of work	Agreement No	Expenditure incurred by 31.3.2017
1	Improvement and strengthening of Bank of service road from RD 6.00Km to 9.00Km of Dhanpur Distributary.	27p1/16-17	762620
2	Improvement and strengthening of bank of service road from RD 0.990 Km to 5.000 Km of Ananta Distriputary.(working RD 990 M to 3590m).	34p1/16-17	971648
3	Improvement and strengthening of bank of service road from RD 4.700 Km to 10.000 Km of Jeypore Distriputary.(working RD 6087 M to 6892m).	35p1/16-17	990521
	TOTAL		2724789

4. LIST OF WORKS TAKEN UP UNDER 20-2700 Maintenance of Roads.:

Sl no	Name of work	Agreement No	Expenditure incurred by 31.3.2017
1	Improvement to service road from RD 6.00 Km to 7.30 Km connecting village Mahaliaput to Jogiput(Working RD 6.00 Km to 8.00 Km of Padmapur Distributary).	32P1/16-17	1383764/-
	Total		1383764

Dam Rehabilitation and Improvement Project (DRIP) :

There is a comprehensive action plan for rehabilitation of U.K. Main dam & Satiguda Dam , duly approved by CPMU (a subsidiary unit of CWC) and funded by World Bank. The project cost of rehabilitation for Upper Kolab Main Dam and Satiguda Dam are **Rs.1230 crore** and **Rs.310.61 crore** respectively. All major distress conditions like leakage control, slope protection on down-stream side flanks , lighting to dam top, installation of real time flood forecasting, instrumentation, automatic gauge reading , security measures, improvement of communications, etc. have been included to overcome the difficulties faced during day to day operation & maintenance and also to have a modernized monitoring system at the time of exigency.

Now, the works are in full swing at Satiguda Dam and Upper Kolab Dam. The up-to-date status of all the works under this scheme are mentioned below.

(Rs in Lakhs)

Name of Dam	Approved amount as per P.S.T.	Total amount of Estimates approved	Total amount of agreement	Expenditure incurred during 2015-16	Expenditure incurred during 2016-17	Cumulative Exp incurred by 31.3.2017
U.K.DAM	1230.00	1187.62	1205.70	93.65	739.391	833.041
SATIGUDA DAM	310.61	329.37	317.82	220.20	86.235	306.435
Total	1540.61	1516.99	1523.52	313.85	825.626	1139.476
					99.996%	

5.LIST OF WORKS TAKEN UP UNDER 20-4701-37081- DRIP DURING 2016-17

Sl no	Name of work	Agreement No	Expenditure incurred by 31.3.2016
1	Leakage control through Spillway body walls, Head Regulator structures by drilling, grouting & Reaming of VDP & foundation holes pf drainage gallery of Satiguda Dam Upper Kolab Project.	01 NCB/15-16	1443214/-
2	Dam Rehabilitation & Improvement Project(DRIP) of Satiguda Dam UKP.	02 NCB/15-16	6580481/-
3	Renovation & Special Repair to lighting system for Upper Kolab Dam under DRIP	03-NCB/15-16	445647/-
4	Beautification of Garen at U.K.Dam under DRIP	04-NCB/15-16	2820990/-
5	Supplying & Installation of 30 KVA silent Diesel Generator Set & lighting arrangement at Dam top road Head Regulator Gates & Gallery inside of Satiguda Dam under DRIP.	05-NCB/15-16	600000/-
6	Change of rubber seals of 11 nos of Spillway Radial Crest Gate of U.K.Main Dam under Drip	06-NCB/15-16	1155000/-
7	Sand blasting and painting of 11 nos.of Spillway Radial gates (Upstream sides only) of UK Dam,UKP.	07-NCB/15-16	1401180/-
8	Treatment to Upstream and Downstream faces with PICC mortar/High strength fiber reinforced repair mortar or equivalent non shrink mortar & grouting works to eradicate the distress condition of Dam body wall of UK Dam under DRIP(Civil work-package)	08-NCB/15-16	3913353/-
9	Improvement to road communication network ,improvement of drainage system and constn. of compound wall/fencing along the boundary of UK Dam Kolabnagar under DRIP.	09-NCB/15-16	16217235/-
10	Down stream protection works on left and right side of Spill channel of IUK Dam with const. of guard walls and stone packing works under DRI	10-NCB/15-16	29802733/-
11	Construction of Watch Tower at Vulnerable locations, renovation of old damaged parapets, providing hand rails on steps inside drainage gallery and other ancillary works of IUK Dam under DRIP.	11-NCB/15-16	5772314/-
12	Repair and Renovation to Radial Crest gate, gantry crane and hoisting arrangement of UK Dam under DRIP.	12-NCB/15-16	2219470/-
13	Supply and Installation of CC TV Camera and other Accessories for Survellance of UK Dam under DRIP.	13-NCB/15-16	2096770/-
14	Installation of solar power station at U.K.Dam under DRIP	15-NCB/15-16	7700000/-
15	Procurement of emergency articles for dam operation and maintainance	P.O.NO 968/20.2.2016	394280/-
	Total		82562667/-

QUALITY CONTROL OBSERVATIONS

For Important works the following quality control activities being conducted.

1. The important ongoing works of this division are being inspected by the officers entrusted by the Quality Control Division, Bariniput. The observations pointed out by the officers of the Quality control Division time to time are being attended & rectified regularly.
2. The observations of higher officers such as S.Q.M. including Chief Construction Engineer are also being complied.
3. Required test for concrete, soil, sand & water content etc are being conducted from time to time as per the stipulations. Other test for materials such as cement, steel, reinforcement, aggregate & cement are also being carried out at the Quality Control lab, Jeypore, Khatiguda & Sunabeda.

Sd/-

Executive Engineer,
U.K. Head Works Division