

Appendices

Appendix-1 (Refer paragraph 1.6 at page 5)

Sampling Methodology

There were 3,74,823 tenders published since inception of the system upto 31 March 2022 with tender value ₹3,32,021.41 crore (except records for test type of tenders). Out of these published tenders, 1,77,593 tenders with tender value ₹1,74,019.46 crore was published during last five years *i.e.*, between 01 April 2017 to 31 March 2022 by 29 Departments out of 40 departments under Government of Odisha. Audit will verify the sampled tenders published during last five years *i.e.*, from 2017-18 to 2021-22 at field level.

The following risk assessment is considered for selection of sample tenders for physical verification during audit of e-Procurement taken up by field audits.

Stratification

Tenders are stratified on the basis of types of tenders

- Limited Tenders
- Open Tenders/ National competitive bid/ Global Tenders

Parameters for risk assessment:

Parameter-1. Number of Bids Received per tender.

Count of bids received against each tender prepared. The higher number of bids received means lower the risk. The lowest number of bid received for tender was '1' and the highest number of tenders received was '350'. The average number of bid received was 6. Further, the stata for number of bids received with tender count is as follows :

Range of number of Bids	Tender Count
1-5	1,04,515
6-10	27,084
11-20	18,246
21-30	5,568
31-40	2,177
41-50	1,083
51-60	527
61-70	393
71-80	159
81-90	92
91-100	66
101-200	119
201-400	8
Nil bids	17,440

As maximum number of tenders received one to 5 number of bids for tenders, tenders more than 5 bids are not allocated any score and tenders received 5 and less than 5 bids were inverse normalised using the following formula.

$$z_i = 1 - (x_i - \min(x)) / (\max(x) - \min(x))$$

Where-

x_i = number of bids received for that tender

$\min(x)$ = minimum number of bids received, taken as 1

$\max(x)$

= maximum number of bids received, taken as 5

Parameter-2. Tenders cancelled/ retendered

The tenders cancelled /retendered is marked as 1 , otherwise 0.

Parameter-3. Last bid being accepted.

If the condition is true the score is 1, otherwise 0.

Parameter-4. Difference of Time remaining (for close of tender) w.r.t. time of submission of accepted bid. If such difference is greater than 24 hours, no risk score was allocated. Where difference is less than 24 hours, the lowest difference allotted more score and the highest difference allotted less score. The normalised formula is

$$z_i = 1 - (\min(1, B - C))$$

Where-

B = Last date of submission of bid

C = Time of submission of bid

and if $B-C > 1$ then minimum 1 is taken, E.g.,

Tender-Id	Last date of submission of bid	Time of submission of bid that was accepted	Difference	Normalised Score
A	B	C	D = Min(1,B-C)	E
T-1	31-01-2022 15:00	31-01-2022 14:45	0.010417	1
T-2	31-03-2022 15:00	30-03-2022 15:00	1	0
T-3	20-01-2022 15:00	20-01-2022 05:00	0.416667	0.589474
T-4	15-02-2022 15:00	11-02-2022 17:00	1	0
T-5	20-02-2022 15:00	18-02-2022 15:00	1	0

Parameter-5. Same set of bidders bidding for similar work types.

Top-5 set of bidders who bid together identified. Tenders having those sets of bidders given risk score 1 and other tenders are allocated 0.

Parameter-6. Tenders having at least one bid submitted from the IP address of department.

If the tender has at least one bid submitted from the same IP as that of department, but the L-1 bid was submitted from a different IP – the score is 0.5, if the bid approved (L-1) has been submitted from the same IP as that of department, the score is 1, otherwise 0.

Parameter-7. Tenders having two or more bids submitted from suspected collusion.

- i. Same IP address
- ii. Same PAN
- iii. Same mobile number
- iv. Same GSTN Number

If the condition is true the score is 1, otherwise 0.

Parameter-8. Estimated Financial Value of tender

The tender value range wise tender count is as follows:

Range of tender value	Number of tender
0-5 lakh	43,665
5-25 lakh	78,555
25-50 lakh	22,623
0.5 -1 crore	13,674
1-5 crore	14,534
5-10 crore	2,649
10-50 crore	1,615
50-100 crore	102
100-200 crore	73
200-500 crore	85
500 crore and above	18

Quartile range and upper and lower limit calculated in excel sheet taking tender value for calculation

1st quartile	3rd quartile	Inter Quartile Range (IQR)	Upper Bound	Lower Bound
=QUARTILE (D2:D177594,1)	=QUARTILE (D2:D177594,3)	=Quartile3- Quartile1	=Quartile 3 + 1.5*IQR	=Quartile1- 1.5*IQR
5,00,000	34,86,920	29,86,920	79,67,300	-39,80,380

Hence the upper bound is rounded as 79,67,300 = 80,00,000. As higher value of tender means higher risk, the tenders with tender value more than 80,00,000 allotted score 1 and for tender value less than 80,00,000, the score was calculated using the following formula.

$$z_i = 1 - ((8000000 - x_i)/8000000)$$

Where-

$$x_i = \text{value of tender}$$

Parameter-9. Time allowed for bidding

The difference of time of publishing tender and last date/time of submission of bid is calculated and (inverse) normalised. Bid submission period minimum 10 days with tender value less than Rs. 50 lakh, minimum 15 days with tender value between 50 lakh and 6 crore and minimum 21 days with tender value equal to or more than ₹6 crore is taken for calculation of time allowed for bidding. If such difference is greater than the minimum days specified, no risk score was allocated as per following formula.

$$z_i = (x - x_i)/x$$

Where-

x_i = Difference in time of publishing of tender

and lastdate of submission of bid

x

= minimum Time permissible for tender where $x > 0$ and $x > x_i$

and when $x > x_i$ then $z_i = 0$

Parameter-10. Time taken from opening of bids to signing of contract

As per OPWD code the time taken from opening of bid to award of contract should not exceed more than 90 days. The difference of date of signing the contract/ 31 March 2022 and date of opening of bids is taken and normalised as follows :

$$z_i = (x_i - \min(x))/(\max(x) - \min(x))$$

Where-

x_i

= days Difference between bid opening and signing of contract/'31march 2022'

$\min(x)$ = minimum number of such count, taken as 90 days

$\max(x)$ = maximum number of such count, taken as 180 days

All tenders having time gap less than 90 days between opening of bids and award of contract/contract not awarded as of 31 March 2022 was given score 0 and time gap more than 180 days have been allotted score 1.

Parameter-11. Per cent difference between L1 and L2.

The difference of price quoted by L-1 and L-2 calculated and per cent difference calculated. If such difference is more than 2 per cent, no risk score is allocated. If the per cent difference less than 2 per cent it was normalised as

$$z_i = (2 - x_i)/2$$

Where-

x_i = Percentage difference between L1 and L2 bidder

Parameter-12. Tenders where financial limits specified, have been breached.

As per GFR the tender value below ₹25 lakhs was to be limited tender and ₹25 lakh to ₹200 crore to be open tender and above ₹200 crore to be Global tender. The tenders falling in any of such exception category is allocated risk score 1 and otherwise 0.

Weight Matrix

The following weightage for these parameters for open tender and limited tender is considered for arriving the risk score .

No.	Parameter	Open Tender	Limited Tender
1.	Number of Bids Received per tender	10	0
2.	Number of times a tender has been cancelled earlier and now re-awarded	10	10
3.	Last Bid being accepted	10	10
4.	Difference of Time remaining (for close of tender) w.r.t. time of submission of accepted bid.	10	10
5.	Same set of bidders	10	0
6.	Tenders having IP of department	10	10
7.	Tenders having two or more bids submitted from same IP addresses/ suspected collusion	10	10
8.	Financial Value of bids	5	10
9.	Time allowed for bidding	5	10
10.	Time taken in award of Contract	5	10
11.	<i>Per cent</i> difference between L1 and L2	5	10
12.	Exception cases/ breach of financial limits	10	10
	Total	100	100

Population Frame

There were 3,74,823 tenders published since inception of the system upto 31 March 2022 with tender value 3,31,911.77 crore (except records for test type of tenders). Out of these published tenders, 1,77,593 tenders with tender value ₹ 1,74,019.46 crore was published during last five years i.e between 01 April 2017 to 31 March 2022 by 29 Departments out of 40 departments under Government of Odisha.

Sample selection

For the purpose of sample selection, the tenders published during last five years *i.e.*, from 2017-18 to 2021-22 will be considered involving 1,77,593 tenders as sample universe with tender value ₹ 1,74,019.46 crore.

Selection of Departments

Department wise sum of risk scores of 29 Departments were ranged between 13 to 11,78,243. Based on risk scores, the Departments were stratified as high, medium, and low category and 10 departments out of 29 (35 *per cent*) are selected by stratified random sampling as given below:

Sl No	Range of risk parameter	Category of risk	Number of Departments	Number of Departments selected	Percentage of selection	Departments Selected
01	0 to 5,000	Low Risk	14	2	14.29	(i) Odia Language Literature and Culture (ii) FA&RD
02	5001 to 1,00,000	Medium Risk	15	04	26.66	i. Forest and Environment ii. Steel and Mine iii. Industry vi. Home
03	1,00,001 and above	High Risk	04	04	100.00	i. H&UD ii.RD iii. WR iv. Works.

Selection of Tender Inviting Authority

The TIA has been arranged in descending order of total risk score of each selected department. 48 TIAs were selected by stratified random sampling based on population proportionate to size of the selected Departments. Where there is population less than one then minimum one TIA has been selected. Where there is less than 5 as population in Department, one stratum is considered for selection of TIA.

Selection of Tenders

10 tenders from each selected TIA will be selected by stratified random sampling based on risk scores after forming 2-3 strata on risk score of tenders.

Appendix – II

(Refer paragraph 8.1 at page 42 and 8.5.1 at page 46)

Statement showing discrepancy or missing logs of various dates in the events of record creation where there were missing sequences (gap) between two consecutive ID numbers of a table

SI No	Name of the table where there were gaps in sequential ID data	Gap in consecutive ID data		Gaps	Time stamp of IDs		Remarks
		First ID	Consecutive Second ID		First ID	Consecutive second ID	
1	Tender basic master	63258	63289	32	2019-08-27 17:13:00.571	2019-08-27 18:31:35.591	Log not available from 2019-08-27 17:46:31.813
2	Tender basic master	86448	68519	32	2020-05-19 22:57:47.899	2020-05-20 09:39:35.63	Log not available from 2020-05-20 06:32:08.596
3	Tender basic master	72389	72420	32	2020-12-29 15:44:48.788	2020-12-29 15:48:39.384	Log not available from 2020-12-29 13:30:38.236
4	Tender basic master	73375	73406	32	2021-02-03 08:05:58.415	2021-02-03 07:12:49.432	Log not available from 2021-02-03 05:24:14.568
5	Tender basic master	76428	76459	32	2021-06-08 21:12:13.482	2021-06-09 07:59:16.046	Log not available for 2021-06-08
6	Bid master	638084	638115	32	2017-01-29 10:03:54.548	2017-01-29 12:47:04.004	Log not available for 2017-01-29
7	Bid master	1463256	1463287	32	2021-02-03 05:18:38.231	2021-02-03 05:57:01.97	Log not available from 2021-02-03 05:24:14.568
8	Bid master	1562730	1562761	32	2021-06-08 22:16:04.345	2021-06-08 22:30:05.616	Log not available for 2021-06-08
9	Bid decryption	1583676	1583857	182	2021-02-10 19:45:49.01	2021-02-11 10:26:11.983	Tender was revoked after bid decryption deleting records from bid decrypted table
10	Bank transaction history details	526551	527377	827	2018-10-31 17:08:33.951	2018-11-01 07:58:12.936	The transaction details were not available in the log of that day.