भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
उत्तर क्षेत्रीय विद्युत समिति
Northern Regional Power Committee

No. उ.क्षे.वि.स./प्रचालन/107/01/2022/4708-4746 दिनांक: 21.06.2022

सेवा में : संरक्षण उप-समिति के सदस्य (सूची के अनुसार) ।
To: Members of Protection Sub-Committee (As per List)

विषय: संरक्षण उप-समिति की 45वीं बैठक की अतिरिक्त कार्यसूची |
Subject: Additional Agenda for 45th Protection Sub-Committee Meeting.

संरक्षण उप-समिति की 45वीं बैठक, **24.06.2022** को **11:00** बजे से **वीडियो कॉन्फ्रेंसिंग** के माध्यम से आयोजित की जाएगी | उक्त बैठक की अतिरिक्त कार्यसूची इसके साथ संलग्न है |

The 45th meeting of Protection Sub-Committee is scheduled to be held on **24.06.2022** at **11:00 Hrs** through **Video Conferencing**. The additional agenda for the meeting is attached herewith.

21/06/2022.
(सौमित्र मज़ूमदार)
अधीक्षण अभियंता (प्रचालन)

Additional Agenda for

45th Meeting of Protection Sub-committee of Northern Regional Power Committee

Time of meeting : 11.00 Hrs.

Date of meeting : 24.06.2022

AA.1 Reviewing the Time Delay setting for Special Protection Scheme (SPS) installed at 400 kV S/S Deepalpur (Agenda by HVPNL)

1. The Chief Engineer, SO & Comml, HVPNL, Panchkula vide office memo No. Ch. 81/PC- 73/SLDC/OP dated 15.09.2021 (**Annexure-1**) intimated that a proposal for enhancement of ATC/TTC for the month of September 2021, up to 8771 MW, was submitted to Northern Region Load Dispatch Center (NRLDC). Northern Region Load Dispatch Centre (NRLDC) has not allowed to increase the ATC/TTC limits of Haryana State beyond 7840 MW/8500 MW till the N-1 contingency of 400/220KV Deepalpur ICTs is not attended.
2. A committee of following officers was formed by Director (Technical), HVPNL, Panchkula (**Annexure – 2**) to ensure the timely action on the issue suggested by NRLDC for enhancement of ATC/TTC limits for Haryana State

   a) Chief Engineer/SO & Comml, HVPNL Panchkula — Chairman

   b) Chie Engineer/TS HVPNL, Panchkula — Member

   c) Superintending Engineer/TS HVPNL Panchkula — Member

   d) Superintending Engineer/Planning HVPNL, Panchkula — Member

   e) Superintending Engineer/TS HVPNL Rohtak — Member

   f) Executive Engineer/LD&PC HVPNL Panipat — Member Secretary
3. The Work Order No. 220/WO-5/2021-22/Vol-V dated 15.03.2022 was issued to M/s Synergy System & Solutions for installation of SPS scheme at 400KV S/Stn Deepalpur (**Annexure-3**).

   The SPS scheme was installed & commissioned by M/s Synergy at 400 KV S/Stn Deepalpur on dated 14.05.2022 by simulating the ICTs set point load and verified the trippings of ICTs. The MOM dated 14.05.2022 is attached as **Annexure–4,** as per following approved SPS Scheme Logic (**Annexure-5**).

Sl. No.	Conditions	Delay in Tripping of ICT LV Side	Case	Action	Remarks
1	If 910A <= X1 then	0 ms	Case-1	Tripping of ICT-3 & 4	Ok tested

2	If 910A <= X2 then	0 ms	Case-2	Tripping of ICT-3 & 4	Ok tested
3	If 1820A <= X1 & X2 then	150 ms	Case-3	Tripping of ICT-3 & 4	OK Tested

(X1 = Total running load on ICT-1; X2 = Total running load on ICT-2)

4. On 29.05.2022 at 18:18 hrs under SPS Case–3, ICT-1 & ICT-2, both were on load & at fault, total running load of ICTs were greater than set point i.e., 1820 A (Case-3 as mentioned above) and load difference 2832 A. SPS executed tripping command to Incomer of ICT-3 & ICT-4 under N-1 contingency.

5. After analysis, it was observed that time delay provided in SPS logic is on lower side i.e., 150 msec, whereas DPS relays installed on 220KV Deepalpur Sec-6 circuit–2 operated in zone-2, 9.4 KM with heavy fault in red phase (i.e., 11.40 kA. Trip log detail of event is placed as **Annexure-6**).

6. M/s Synergy Engineer suggested the tripping time delay of 400 msec in SPS scheme for clearing the fault by Distance Protection Relay under Zone-1 & Zone-2 in the meeting held on 01.06.2022 at 400KV Substation Deepalpur among M/s Synergy, M/s Indigrid, Deepalpur and HVPNL (TS and M&P wing). (**Annexure-7**).

7. As confirmed by M/s Indigrid (400KV S/Stn., Deepalpur), 400 KV 315 MVA ICTs (ICT-1 & ICT-2) are able to sustain up to 120% of full load current (i.e., 992 A) (Copy of O/C Protection setting of ICTs is placed as **Annexure-8**).

8. After detailed technical deliberations, as installation of SPS Scheme is new in HVPNL, therefore for a time gap arrangement, the time delay settings as detailed below has been implemented to prevent SPS operation during fault condition during the meeting held on 06.06.2022 (**Annexure-9**) in presence of HVPNL (TS as well as M&P wing) and M/s Indigrid.

Sl. No	Conditions	Time Delay	Case	Action
1	If 910<=X1 then	450msec	Case 1	Tripping of LV Side of ICT 3 &4
2	If 910<=X2 then	450msec	Case 2	Tripping of LV Side of ICT 3 &4
3	If 1820<=X1&X2 then	1200msec	Case 3	Tripping of LV Side of ICT 3 &4

a. As per suggestion of M/s Indigrid (Deepalpur), the time delay of 450 msec in Case-1 and Case-2 is provided keeping in view the special circumstances i.e., ICT1 is in shutdown and fault is observed in Zone-2 in

one of the lines running from ICT-2 and vice versa and same should be cleared by Distance protection scheme instead of SPS.

b. The time delay of 1200 msec in Case-3 has been kept, to ensure tripping in Zone-3 through distance protection scheme instead of SPS, incase both the ICT1 and ICT 2 are operating in parallel.

9. Being the first ever SPS of Haryana State, agenda is put up in Protection Subcommittee for deliberations and deciding the time delay settings of SPS for overall philosophy and its implementation.

***Members may deliberate*.**

Annexure - 1

HARYANA VIDYUT PRASARAN NIGAM LTD.
Regd. Office: Plot no. C-4, Shakti Bhawan, Sector-6, Panchkula
Corporate Identity Number:U40101HR1997SGC033683
Website: www.hvpn.org.in Email: cesocomml@hvpn.org.in
HVPN Tel No: Phone: 0172-2566335 Fax No : 0172-2560622

To

1. Chief Engineer/ TS, HVPNL Panchkula.
2. Chief Engineer/ P&M, HVPNL Panchkula

Memo No: Ch-81 /PC-73/SLDC/ 'OP' Dated: 15.09.2021

Subject: Regarding Enhancement of ATC/TTC Limits for Haryana State.

On the basis of load management, a proposal for enhancement of ATC/ TTC for the month of September 2021, up to 8771 MW, was submitted to Northern Region Load Despatch Centre (NRLDC). NRLDC vide email dated 08.09.2021 has not allowed to increase the ATC/ TTC limits of Haryana state beyond 7840 MW/ 8500 MW, till the N-1 contingency of 400/ 220kV Deepalpur ICTs and 400/ 220kV Panipat (BBMB) are attended. NRLDC response is elaborated as under :

".. till 400/220kV ICT capacity is augmented at Deepalpur, enhancement of import TTC as proposed by Haryana is not advisable, without making an interim arrangement of implementing suitable SPS, to prevent the cascaded tripping of ICTs."

In this regard please refer to this office memo no. 324/ SO/PNP/PCP-130/Vol.-I dated 08.07.2021, memo no. 325/ SO/PNP/PCP-130/Vol.-I dated 08.07.2021, memo no. Ch-59/PC-73/SLDC/'Op' dated 19.07.2021, memo no.Ch-60/PC-73/SLDC/'Op' dated 19.07.2021 and memo no. Ch-68/PC-73/SLDC/'Op' dated 01.09.2021 vide which it was requested to take necessary actions as suggested by NRLDC to mitigate the overloading constraints. The action taken in respect of SPS implementation from the CE TS HVPNL, Panchkula is still awaited.

Further, following contingencies/overloading of substations/lines are also pointed out by NRLDC.

1. N-1 contingency at 400kV Deepalpur and 400kV Panipat BBMB substations.
2. 220kV Mohana-Sonipat PG D/C line.

HVPNL has already approved below mentioned transmission system strengthening works to overcome the overloading of above line and to give relief to 400/220 kV transformers at Deepalpur and Panipat BBMB 400 kV substations:

1. LILO of 220kV Mohana – Samalkha D/C at Sonipat PGCIL
2. 220kV GIS Rai S/Stn.
3. 220kV Rai – Sonipat PGCIL D/C

The commissioning of above transmission system will sort out the problems upto some extant and provide cushion for enhancement of ATC/ TTC limits required to cater the forecasted paddy season demand of year 2022.

In view of the above, it is again requested to take immediate necessary actions for providing SPS at Deepalpur substation and commissioning of already approved transmission works so that NRLDC may be requested for enhancement of ATC/TTC limits of Haryana accordingly.

Chief Engineer, SO & Comml,
HVPNL, Panchkula.

CC:

1. SPS to MD/HVPNL, Panchkula for kind information of Managing Director, HVPNL please.
2. SPS to Director/Technical, HVPNL, Panchkula for kind information of Director Technical/HVPNL, Panchkula please.
3. SPS to Director/ Projects, HVPNL, Panchkula for kind information of Director/ Projects/HVPNL, Panchkula please.

AEE/WORKS.....
Supdt. .....
C.H.D. .....
S.S. Steno. .....
S.E. .....

Annexure - II

HARYANA VIDYUT PRASARAN NIGAM LTD.
Regd. Office Shakti Bhawan Sector 6, Panchkula
Corporate Identity Number U40101HR1 97SGC033683
Website www.hvpn.gov.in Email [illegible]
Tel No. Phone 0172-2566335 Fax No. 017 -2560622

Office Order No. Ch-167/TC-87/SLDC/OP Dated: 22.09.2021

Subject:- **Enhancement of ATC/TTC Limits for Haryana state.**

The proposal for enhancement of ATC/TTC for the month of September 2021 up to 8771 MW, was submitted to Northern Region Load Despatch Centre (NRLDC). NRLDC has restricted the ATC/TTC limit of Haryana as 7840 MW/8500 MW, till the N-1 contingency of 400/220 kV Deepalpur ICTs and 400/220 kV Panipat (BBMB) is attended.

A committee of the following officers is hereby constituted to e[illegible] action on the issues suggested by NRLDC.

1	Chief Engineer/SO & Comml, HVPNL, Panchkula	Chairman
2.	Chief Engineer/TS, HVPNL, Panchkula	Member
3.	Superintending Engineer/TS, HVPNL, Panchkula	Member
4.	Superintending Engineer/Planning , HVPNL, Panchkula	Member
5.	Superintending Engineer/TS, HVPNL, Rohtak	Member
6	Executive Engineer/LD & PC, HVPNL, Panipat	Member Secretary

The committee will submit its report within 15 days on the following issues.

i. Installation of SPS at 400 kV sub-station Deepalpur
ii. LILO of 220kV Mohana – Samalkha D/C at Sonipat PGCIL
iii. 220kV GIS Rai S/Stn.
iv. 220kV Rai – Sonipat PGCIL D/C.

This is issued with the approval of Director/ Technical, HVPNL, Panchkula

Executive Engineer/ SLDC /OP
HVPNL Panchkula

Endst. No Ch-[illegible]/TC-87/SLDC/OP Dated: 22.09.2021.

Copy to:

1 SPS to Managing Director, HVPNL for kind information of Managing Director, HVPNL please
2 SPS to Director/Technical, HVPNL for kind information of Director/Technical, HVPNL please
3 All respective committee members for information and necessary action please.

Executive Engineer/SLDC /O
HVPNL Panchku

Annexure - 3

File No. HVPNL-SPNP04494/1/2021-SSE 132kV SSTN PTPS PANIPAT-HVPNL

GOVERMENT OF HARYANA
HVPNL
SSE 132kV S/STN PTPS PANIPAT

SUBJECT

Main Category	:	
Sub Category	:	
Description	:	Proposal for implementation of Special Protection Scheme at 400KV S/Stn Deepalpur for increase of ATC/TTC limits of Haryana state.

OTHER DETAILS

Language	:	English
Remarks	:	

HARYANA VIDYUT PRASARAN NIGAM LTD.
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HVPN Tel No: Phone: 0172-2566335 Fax No : 0172-2560622

To

1. Chief Engineer/ TS, HVPNL Panchkula.
2. Chief Engineer/ P&M, HVPNL Panchkula

Memo No: Ch-81 /PC-73/SLDC/ 'OP' Dated: 15.09.2021

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".. till 400/220kV ICT capacity is augmented at Deepalpur, enhancement of import TTC as proposed by Haryana is not advisable, without making an interim arrangement of implementing suitable SPS, to prevent the cascaded tripping of ICTs."

In this regard please refer to this office memo no. 324/ SO/PNP/PCP-130/Vol.-I dated 08.07.2021, memo no. 325/ SO/PNP/PCP-130/Vol.-I dated 08.07.2021, memo no. Ch-59/PC-73/SLDC/'Op' dated 19.07.2021, memo no.Ch-60/PC-73/SLDC/'Op' dated 19.07.2021 and memo no. Ch-68/PC-73/SLDC/'Op' dated 01.09.2021 vide which it was requested to take necessary actions as suggested by NRLDC to mitigate the overloading constraints. The action taken in respect of SPS implementation from the CE TS HVPNL, Panchkula is still awaited.

Further, following contingencies/overloading of substations/lines are also pointed out by NRLDC.

1. N-1 contingency at 400kV Deepalpur and 400kV Panipat BBMB substations.
2. 220kV Mohana-Sonipat PG D/C line.

HVPNL has already approved below mentioned transmission system strengthening works to overcome the overloading of above line and to give relief to 400/220 kV transformers at Deepalpur and Panipat BBMB 400 kV substations:

1. LILO of 220kV Mohana – Samalkha D/C at Sonipat PGCIL
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The commissioning of above transmission system will sort out the problems upto some extant and provide cushion for enhancement of ATC/ TTC limits required to cater the forecasted paddy season demand of year 2022.

In view of the above, it is again requested to take immediate necessary actions for providing SPS at Deepalpur substation and commissioning of already approved transmission works so that NRLDC may be requested for enhancement of ATC/TTC limits of Haryana accordingly.

Chief Engineer, SO & Comml,
HVPNL, Panchkula.

CC:

1. SPS to MD/HVPNL, Panchkula for kind information of Managing Director, HVPNL please.
2. SPS to Director/Technical, HVPNL, Panchkula for kind Information of Director Technical/HVPNL, Panchkula please.
3. SPS to Director/ Projects, HVPNL, Panchkula for kind information of Director/ Projects/HVPNL, Panchkula please.

AEE/WORKS.....
Supdt. .....
C.H.D. .....
S.S. Steno. .....
S.E. .....

HVPN

HARYANA VIDYUT PRASARAN NIGAM LTD.
(A GOVT. OF HARYANA UNDERTAKING)
STATE LOAD DISPATCH CENTER
Corporate Identity Numer. U4010HR1997SGC03368
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(Regd. Office: - Sec-6, Shakti Bhawan, Panchkula)
Email: xenldpc@hvpn.org.in
sldcharyanacr@gmail.com
0180-2664095 (Ph), 0180-2670819 (Fax)

To

1. The CE/TS, HVPNL, Panchkula.
2. The SE/TS Circle, HVPNL, Rohtak & Panchkula.
3. The SE/Planning, HVPNL, Panchkula

Memo no. 09/So/PNP/PCP-223 Dated: 15-11-2021

Subject:- Enhancement of ATC/TTC limits for Haryana State.

Please refer to office order no. 167/PC-87/SLDC/OP dated 22.09.2021 vide which a committee was constituted with the approval of Director Technical, HVPNL, Panchkula to ensure timely action on the issues suggested by NRLDC for enhancement of ATC/TTC limits of Haryana state.

Accordingly, a meeting is scheduled to be held in chamber of the CE/SO&C, HVPNL, Panchkula on dated 17.11.2021 at 03:00 PM to discuss the issues mentioned in above referred office order.

It is therefore requested to make it convenient to attend the meeting along with relevant record please.

XEN/LD&PC,
HVPNL, Panipat.

CC to:-

1. The CE/SO&C, HVPNL, Panchkula for kind information please.
2. The SE/SLDC'OP', HVPNL, Panchkula for kind information please.

HARYANA VIDYUT PRASARAN NIGAM LTD.
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Tel No Phone 0172-2566335 Fax No 017 -2560622

Office Order No. CH-167/TC-87/SLDC/OP Dated: 22.09.2021

Subject:- **Enhancement of ATC/TTC Limits for Haryana state.**

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A committee of the following officers is hereby constituted to e action on the issues suggested by NRLDC.

1	Chief Engineer/SO & Comml, HVPNL, Panchkula	Chairman
2.	Chief Engineer/TS, HVPNL, Panchkula	Member
3.	Superintending Engineer/TS, HVPNL, Panchkula	Member
4.	Superintending Engineer/Planning , HVPNL, Panchkula	Member
5.	Superintending Engineer/TS, HVPNL, Rohtak	Member
6	Executive Engineer/LD & PC HVPNL Panipat	Member Secretary

The committee will submit its report within 15 days on the following issues.

i. Installation of SPS at 400 kV sub-station Deepalpur
ii. LILO of 220kV Mohana – Samalkha D/C at Sonipat PGCIL
iii. 220kV GIS Rai S/Stn.
iv. 220kV Rai – Sonipat PGCIL D/C.

This is issued with the approval of Director/ Technical, HVPNL, Panchkula

Executive Engineer/ SLDC /OP
HVPNL Panchkula

Endst. No CH-85/TC-73/SLDC/OP Dated: 22.09.2021.

Copy to:

1 SPS to Managing Director HVPNL for kind information of Managing Director, HVPNL please
2 SPS to Director/Technical HVPNL for kind information of Director/Technical HVPNL please
3 All respective committee members for information and necessary action please.

Executive Engineer/SLDC /O
HVPNL Panchku

SPS related to overloading of Transformers

SPS would be provided at those locations where loading on ICT does not fulfil the "N-1" criteria, during full loading conditions.

Sample Calculation of Designing SPS for ICTs

		Single Transformer	Single Transformer	
ICT Rating	MVA	315	240	
Overload Capacity	%	10	10	
Over load Rating	MVA	347	264	
No. of ICTs in Parallel	Total Transformation Capacity (MVA)	Permissible loading per ICT satisfying the (N-1) criteria	Total loading on the remaining ICT under (N-1) contingency	
2	630	174	347	55.08%
3	945	231	694	73.44%
4	1260	260	1041	82.62%
3	795	176	528	55.87%
	(2*240+1*315)	264*2/3		

SPS Scheme logic:

The SPS would shed load in groups depending on no. of ICTs in operation. In order to achieve it, loads for shedding by SPS would be divided into number of groups. The no. of groups would be one less than the no. of transformers operating in parallel. Count the no. of ICTs operating in parallel.

Case-1

Contingency: Loading on the ICT is more than 85 % and no. of ICTs operating in parallel is 4 and 1 out of these 4 ICT trips.

Action: Shed load in one of the identified groups.

Case-2

Contingency: Loading on the ICT is more than 75 % and no. of ICTs operating in parallel is 3 and 1 out of these 3 ICT trips.

Action: Shed load in one of the identified groups

Case-3

Contingency: Loading on the ICT is more than 55 % and no. of ICTs operating in parallel is 2 and 1 out of these 2 ICT trips.

Subject: Technical proposal for implementation of Special Protection Scheme at 400KV S/Stn Deepalpur.

Chief Engineer, SO & Comml, HVPNL, Panchkula vide his office memo no. ch-81/PC-73/SLDC/'OP' dated 15.09.2021 **(Placed at Annexure-1)** intimated that a proposal for enhancement of ATC/TTC for the month of September 2021, up to 8771MW, was submitted to Northern Region Load Dispatch Center (NRLDC). However, NRLDC has not allowed to increase the ATC/TTC limits of Haryana state beyond 7840MW / 8500 MW till the N-1 contingency of 400/220KV Deepalpur ICTs is not attended. A committee of officers were formed by worthy Director / Technical, HVPNL, Panchkula conveyed vide XEN / SLDC / OP, HVPNL, Panchkula office memo no. ch-85/PC-73/SLDC/OP dated 22.09.2021 **(Placed at Annexure-2)** to ensure the timely action on the issues suggested by NRLDC for enhancement of ATC/TTC limits for Haryana State. In continuation of the same, a draft technical proposal for implementation of SPS at 400KV S/Stn Deepalpur to attain N-1 contingency for 400/220KV Deepalpur ICTs is designed and elaborated as below:

400KV S/Stn Deepalpur has a capacity of 2x315MVA, 400/220KV ICTs + 2x100 MVA, 220/132KV T/Fs. As per NRPC guidelines as well as Haryana Grid Code, all the Transmission System designed in the state should meet the N-1 contingency criteria. However, the 400/220KV ICTs at 400KV S/Stn Deepalpur does not fulfill the criteria of N-1 contingency. The purpose of implementation of Special Protection Scheme (Herein after called as SPS) at 400KV S/Stn Deepalpur is to make the 400/220kV ICT-1&2 N-1 compliant, till the augmentation of already installed ICTs or installation of additional ICT.

1. **Scope for SPS at 400KV S/Stn Deepalpur:-**

The purpose of N-1 contingency is to save the power equipment's from tripping when one power equipment in the same loop gets tripped. In the case of 400 KV S/stn Deepalpur, 2 x 315 MVA ICTs are running in parallel and one ICT have to take the load of another in case of tripping of any one. In such scenario, the ICT that remains in service should not trip on overloading if other ICT trips and fulfills the criteria of N-1 contingency. By installing SPS, N-1 criteria can be achieved at 400KV S/Stn Deepalpur.

2. **How N-1 contingency criteria can be achieved at 400KV S/Stn Deepalpur:-**

To achieve the N-1 contingency, it is important that if one ICT trips then load on other ICT should not be higher than 347 MVA (10% above full load capacity) as per NRPC approved schemes (**SPS related to overloading of Transformers placed at Annexure-3**) for curtailing loads when 2 no. ICTs are running in Parallel (as tabulated below in Table no. 1). To avoid the overloading of running ICT, it is important to curtail the load (which is higher than 347 MVA) running through these ICTs.

Table no. 1:

Sample Calculation of Designing SPS for ICTs:-

		Single ICT Rating	
ICT Rating	**MVA**	**315**	
Overload capacity	**%**	**10**	
Overload Rating	**MVA**	**347**	
No. of ICTs in Parallel	**Total Transformation Capacity**	**Permissible loading per ICT satisfying N-1 criteria**	**Total loading on remaining ICT under N-1 contingency**
2	**630**	**174**	**347**

The SPS would shed load in groups depending on no. of ICTs in operation. In order to achieve it, loads for shedding by SPS would be divided into number of groups. The no. of groups would be one less than the no. of transformers operating in parallel. Therefore in case of 400KV S/stn Deepalpur where 2 no. ICTs are installed, load shedding will be done in one group only.

The present maximum load observed on ICTs at 400KV S/Stn Deepalpur is 250 MVA each that makes 500 MVA on both the ICTs. In such a scenario total load of 153MVA needs to be shed considering 10% overload capacity of the running ICT. The SPS to be installed should work in such a manner that load must be shed before initiation of overload relay on running ICT. Such load shedding criteria is detailed as below:-

Table no. 2:

Scheme no.	Load shedding required	Load shedding will be achieved as below		
		SPS to be installed at	Load	Total load shedding
1	153 MVA	132kV Incomers of 220/132KV, 100MVA T-3 and T-4 T/F at 400KV S/Stn Deepalpur	85+85 MVA	170 MVA

Elaboration:

This scheme will operate when one ICT trips and total load on both ICTs is higher than 347 MVA i.e. 10% overload capacity of running ICT. In that case desired load will be shed by switching off the equipment's as tabulated in table no.2. Implementation of this scheme requires to install 2 no. load protection relays on incomers and single initiation scheme at 400 KV Deepalpur which needs to be done through the contractors having expertise in such schemes and working in power grid.

The ultimate area that will be affected in operation of scheme no. 1 is detailed as below:-

i. Supply of all the 132KV lines running from 400KV S/Stn Deepalpur will be affected which include further 33kV S/Stns as below:

   a. 132kV Khewra :- 33kV Khewra, 33kV HUL and 33kV Jakholi
   b. 132kV Rai:- local load of 11kV feeders running from 132KV S/stn Rai and 33kV Rai, 33kV safiabad, 33kV Barota, 33kV Nara and 33kV Ansal
   c. 132KV Tajpur :- 33kV Ladsoli, 33kV Nandnaur, 33kV Tajpur, 33KV Hasanpur, 33kV Solid waste
   d. 132KV HSIIDC Kundli:- local load of 11kV feeders running from 132KV S/stn HSIIDC Kundli and 33kV NIFTEM, 33kV HSIIDC Kundli

3. Remarks:

i. Whenever SPS operates at any above detailed S/Stn, then it must be ensured that no feeder be energized or its load be shifted to any another source without consent of SLDC Panipat.

ii. Tripping of 132kV incomers of 220/132KV, 100MVA T/F's may not be considered for calculation of TSA as tripping is occurred for the safety of the Grid.

-3-

In view of the position explained above, following is submitted for approval from competent authority of HVPNL and UHBVNL for further submission to NRPC:

i. Technical approval for installation of above detailed scheme at S/stns tabulated above in table no. 2.

ii. Approval for disruption in power supply to the area as detailed in scheme tabulated above in table no. 2.

Submitted please.

6/10/21

Er. Rajeshwar Sharma
XEN / TS Div.
HVPNL, Panipat

SE / TS, Circle, Rohtak

May please consent for installation of SPS pl.

6/x/2021

(Er. B. S. Dahiya)
SE / TS Rohtak.

SE/OP. Sonipat

May pl. be taken up with competent authority of UHBVN for necessary consent etc.

8/x/2021
(SANDEEP JAIN)
SE 'OP' UHBVN,
Sonepat

SE/TS, Rohtak

May take up the matter with consent of UHBVNL authorities please.

12/x/2021
(B.S. Dahiya)
SE/TS Rohtak

CE/TS, Panchkula

May kindly take up matter with CE/HPPC to examine and approve the scheme pl.

(KULDEEP SINGH) 12/10/21
CE/TS PKL

CE/SO-S Commercial

SE/SLDC OP

XEN/SLDC (OP)

AEE/Hect/ip

13/x/21

12.X.2021

14/x/21

CR.77/CCSO-64/Vol.II/CETS/PKL. 12.10.2021

DIARY No. 55...
CE/S.O. & COMML
HVPNL PANCHKULA
Date. 13.10.2021

F.P.P

-4-

The consent/approval from UHBVN needs to be taken from CE/SO, UHBVN and not from CE/HPPC, as HPPC relates with Power Purchase.

The file may please be sent to the concerned committee member constituted by Director/Technical (Annex-2) for taking consent from UHBVN and competent authority of HVPN for further submission to NRPC.

Submitted please.

Joshi
18/10/21
AEE/SLDC/OP

XEN/~~SLDC~~/OP

Please send the file back to SE/TS Rohtak for taking further necessary action.

19/X/21

SE/~~S~~/DC/OP

CE/SO/~~CLM~~

Rajesh Goel
SE/STU.
19/10/2021

SE/~~S~~/DC/OP

19/10/2021

Xen/~~SLDC~~/OP

In the meeting held on dated 30.9.21, in the chamber of CE/SO&Comml. it was decided that TS wing will submit the SPS scheme completed in all respect for approval from NRPC. As such, CE/TS, HVPN, Panchkula may please be requested to take up the matter with UHBVNL and finalize the scheme for approval from NRPC by this office.

SE/~~S~~/DC/OP

— 5 —

FPP.

The file may be sent to CE/TS Panchkula for further action please.

Sd/- 21/X/21

CE/SO & Comml.

DIARY NO. 35
DATED 21.10.2021
CE/SO & COMML.HVPNL

Sd/- 21.X.2021

CE/TS, Panchkula

Sd/- 22/10/21

244B/Works 22/10/2021

SE/TS Rohtak

File may please be sent to CE/SO, UHBVNL, Panchkula for consent/Approval of UHBVNL. The SPS scheme has already been prepared and discussed at NP-1 to 3 pl. case.

Sd/- 22/X/2021
(B.S. Dahiya)
SE/TS, Rohtak.

CE/TS, Panchkula

CH-78/CCSB-64/Vol. II/CETS/PKL.
22.10.2021

CE/SO/UHBVNL

Sd/- 22/10/2021

SE/SO

Sd/- 27/X/2021

Sd/-

As on NP-3, Approved for disruption of Power supply in Area from 400 KV S/Stn Deepalpur is sought. This area falls under OP Sonepat circle, HVPN RTK and so wing has no concerned. May file be forwarded to take comments of 'OP' wing Pl.

Sd/- 27/10/21

CE/SO. Pl. discuss

Sd/- 27/X/2021

SE/SO

XEN/SO. Sd/- 2/11/21

P.T.O. →

Scanned with CamScanner

— 6 —

SO Wing has noted the area likely to be affected when the SPS is operated. SO Wing is not the competent authority to approve the same and there is no such precedence of SO Wing giving approval for such operations on behalf of UHBVN for the SPS already in operation, please.

3/11/2021
XEN/SO

SE/SO As above, Noted for area effected and may Request to expidite instruction of SPS PH.

3/11/21

1060/CESO/UH
Dt 8/11/2021

CB/SO.

CE/TS, Panchkula (HVPNL)

3/11/2021

2605/Comm
8/11/2021

The comment has been received from CE/SO UHBVNL. May deal to accordingly in context of increasing the limits of ATC/TTC for Haryana State pl

SE/TS Rohtak

For fin. pl.

CH-83/CCSB-64/Vol-II/CETS/PH08.11.2021

File recd on 17.11.2021
XEN/TS, PNP

SE/11/21

18/11/2021
SE/TS, Rohtak

For increasing the limits of ATC/TTC for Haryana State, SE/Design be requested for supplying the technical specifications of SPS as per scheme discussed at NP-1 & 2 & SE/SLDC/OP' HVPNL Panchkula be requested for apprising of status regarding SPS to NRLDC.

-7-

Accordingly file be sent to SE/SLDC 'OP' HVPNL Panchkula for further necessary action there.

23/11/21
XEN TS HVPN PANIPAT.

Ch. 135/TCW-552 dt. 23.11.2021

SE/TS HVPN ROHTAK

23/11/21
(Er. B. S. Dahiya)
SE / TS Rohtak.

SE/SLDC 'OP' Panchkula.

25/11/21

XEN/SLDC (OP)

The status of the SPS scheme noted. However, SE/TS HVPN Rohtak may be requested to supply SPS scheme duly approved from the competent authority of HVPN for consideration/approval of NRPC.

File may please be sent to SE/TS Rohtak for further necessary action regarding installation of SPS scheme.

DIARY NO. 415
SE/SLDC/'OP'
DATED 25/11/2021

Jai Ram, 25/11/21
XEN/SLDC 'OP'

SE/SLDC/OP

CD Sangwan /11/21
SE/SLDC/OP

SE/TS HVPN Rohtak
for f.n.a. pl.

1/12/2021
(Er. B. S. Dahiya)
SE / TS Rohtak.

XEN/TS, Panipat

Ch. 136/TCW-552 dt. 01.12.2021

Scanned with CamScanner

QUOTATION

Synergy Systems & Solutions
A-1526, Green Fields Colony
FARIDABAD - 121001-HARYANA
Contact No.:+91 129 2510501, Telefax No.: +91 1292510399
E-Mail-info@s3india.com|Website-www.s3india.com

Tax Registration Numbers
GST No. 06ADOPA2627C1Z2
PAN No. ADOPA2627C
ECC Code ADOPA2627CEM001

XEN/TS Div.HVPNL, Panipat
400/220 KV S/S Deepalpur

Quotation No.:
SSS/2021/30122021/01

Project: Budgetary Quotation for SPS system at 400 KV S/S Deepalpur

Kind attention: XEN/TS Div. HVPNL, Panipat

Dear Sir,
With reference to the above we are pleased to submit our Budgetary quotation for the SPS system at 400 KV S/S Deepalpur

SL. No.	Description	Basic Rate INR	Qty.	Unit	Amount INR
Supply, erection, Testing & Commissioning of SPS System at 400 KV S/S Deepalpur					
	Fully wired standalone panel as per requirement at site for PLC with required accessories and 220 V DC Power supply, associated field cabling and with the following electronics:		1	No	
	19" RTU Rack		1	No	
	RTU E70 16 I/O-slot backplane for 19"-subrack		1	No	
	RTU E70 Rack Power Supply Unit		1	No	
	RTU E70 CPU, 2 LAN, 4 Serial ports		1	No	
	RTU E70 Digital Input Module, Pos Logic, 48VDC		1	No	
	RTU E70 Analog Input Module, 12 ch, Voltage/Current input		2	No	
	RTU E70 Digital Output Module, 16 ch(2 groups of 8) , relay output		1	No	
	Heavy Duty Relay in RTU panel		17	Nos.	
	Timer relay for watch dog		2	Nos.	
	Hooter for Watch Dog		1	No	
	Power Supply 220 VDC input to 48 VDC output		2	Nos.	
1	***Cables***	6,59,296			6,59,296
	4- 20 mA signal cable for Transducer output from ICTs to RTU 6 core stranded copper (0.5mm2) Armored (shielded)		1050	Mtr	
	Digital Input signal cable from control panel to RTU 5 Core Standard Copper Cable 1.5 mm2,Armored		1050	Mtr	
	Digital Output signal cable form control panel to RTU 3 Core Standard Copper Cable 2.5 mm2,Armored		800	Mtr	
	Transducer CT input (R,Y,B Phase) cable in C&R Panels & Feeders single core wire (2.5 mm2)		150	Mtr	
	Transducer Power Supply single core wire (1.5mm2)		50	Mtr	
	CAT5 Communication Cable between RTU and Computer		50	Mtr	
	Supply of 6 Core Outdoor Armoured Fiber Optic Cable, Single Mode		300	Mtr	
	Supply of HDPE Pipe, 40mm Dia		300	Mtr	
	Supply of 6 Port LIU with fully populated with accssories		2	Nos	
	Supply of Fiber to Ethernet Media Converter		2	Nos	
2	PLC Programming Software	39,097	1	No	39,097
3	SCADA Software with license and Server grade computer of minimum configuration as Intel Xeon CPU, 3.30 Ghz, 8 GB main memory,1TB Hard Disk, DVD-RW drive, 19 inch color TFT monitor, Key Board, Mouse, 2 Nos. 10/100/1000 mbps Ethernet port, USB Port, 500VA UPS,AC Power Extension Board, 2 Nos. Speakers	3,49,993	1	No	3,49,993
	Transducer (Aux. Supply 220VDC)				
4	4-20 mA, 3 Ph Current Transducer with 3 Output (Make: AEL/PYROTECH/ELSTER)	13,032	4	Nos.	52,128
5	SCADA user manual PLC user manual Wiring Diagram	3,040	3	Sets	9,120
6	Erection & Commissioning	3,05,647	1	LS	3,05,647
		Total			**16,27,573**
		GST	**18%**		**2,92,963**
		Grand Total			**19,20,536**
G.Total : Ninteen Lacs Twenty Thousand Five Hundred Thirty Six only					

QUOTATION

Synergy Systems & Solutions
A-1526, Green Fields Colony
FARIDABAD - 121001-HARYANA
Contact No.:+91 129 2510501, Telefax No.: +91 1292510399
E-Mail-info@s3india.com|Website-www.s3india.com

Tax Registration Numbers
GST No. 06ADOPA2627C1Z2
PAN No. ADOPA2627C
ECC Code ADOPA2627CEM001

XEN/TS Div.HVPNL, Panipat
400/220 KV S/S Deepalpur

Quotation No.:
SSS/2021/30122021/01

Terms & conditions:

1. Payments terms:
90% of supply portion on supply of material within 30 days and material delivery at site.
10% of supply portion and 100% of erection portion on commissioning of the system.

2. Duties & Taxes:
GST@18% Will be Charged as shown above.

3. Project delivery :
Three (3) Months from the date of LOA (Letter of Acceptance).

4. Completion Period:
Five (5) Months from the date of LOA (Letter of Acceptance).

5.Warrenty Period: 1 Year.

Note :

1.The cable quantity as above mentioned will be provided if additional cable quantity will required then it will be chargeable.
2.Existing cable trenches will be used. Outdoor cable will be buried in the soil if trench does not exist. Indoor cable will be routed along the walls if trench does not exist.
3. Digital Input Signal, Digital output Signal and Power Cable will be provided by customer.
4. The CT & Breaker Status connections should be provided from Control Panel at Kiosk. In case it is provided from Marshelling box, cable quantity would be increased and supply and laying of the same would be additionally charged.
5. The load shedding of the 132kV Incomers of 220/132KV, 100MVA T-3 and T-4 T/F would be done by monitoring the Ampere rating of the connected load. Moreover, for monitoring the 400/220 KV ICT, Ampere rating of the 3-phase incomer would be considered and shown in SCADA

For Synergy Systems & Solutions

Hardeep Singh
(Project Manager)

Note No. #1

Subject: - Proposal for implementation of Special Protection Scheme at 400KV S/Stn Deepalpur for increase of ATC/TTC limits of Haryana state.

Chief Engineer / SO & Comml, HVPNL, Panchkula vide his office memo no. Ch-81/PC-73/SLDC/'OP' dated 15.09.2021 **(placed at Annexure-1)** intimated that a proposal for enhancement of ATC/TTC for the month of September 2021, up to 8771MW, was submitted to Northern Region Load Dispatch Center (NRLDC). However, NRLDC has not allowed to increase the ATC/TTC limits of Haryana state beyond 7840MW / 8500 MW till the N-1 contingency of 400/220KV Deepalpur ICTs is not attended. A committee of officers were formed by worthy Director / Technical, HVPNL, Panchkula conveyed vide XEN / SLDC / OP, HVPNL, Panchkula office memo no. ch-85/PC-73/SLDC/OP dated 22.09.2021 **(placed at Annexure-2)** to ensure the timely action on the issues suggested by NRLDC for enhancement of ATC/TTC limits for Haryana State. In continuation of the same, a draft technical proposal for implementation of SPS at 400KV S/Stn Deepalpur to attain N-1 contingency for 400/220KV Deepalpur ICTs is designed and elaborated as below:

400KV S/Stn Deepalpur has installed capacity of 2x315MVA, 400/220KV ICTs + 2x100 MVA, 220/132KV T/Fs. As per NRPC guidelines as well as Haryana Grid Code, all the Transmission System designed in the state should meet the N-1 contingency criteria. However, the 400/220KV ICTs at 400KV S/Stn Deepalpur does not fulfill the criteria of N-1 contingency. The purpose of implementation of Special Protection Scheme (herein after called as SPS) at 400KV S/Stn Deepalpur is to make the 400/220kV ICT-1&2 N-1 compliant, till the augmentation of already installed ICTs or installation of additional ICT.

1. **Scope for SPS at 400KV S/Stn Deepalpur:-**

   The purpose of N-1 contingency is to save the power equipment's from tripping when one power equipment in the same loop gets tripped. In the case of 400 KV S/stn Deepalpur, 2 x 315 MVA ICTs are running in parallel and one ICT have to take the load of another in case of tripping of any one. In such scenario, the ICT that remains in service should not trip on overloading if other ICT trips and fulfills the criteria of N-1 contingency. By installing SPS, N-1 criteria can be achieved at 400KV S/Stn Deepalpur.

2. **How N-1 contingency criteria can be achieved at 400KV S/Stn**

Deepalpur:-

To achieve the N-1 contingency, it is important that if one 315 MVA ICT trips then load on other ICT should not be higher than 347 MVA (10% above full load capacity) as per NRPC approved schemes (**SPS related to overloading of Transformers placed at Annexure-3**) for curtailing loads when 2 no. ICTs are running in Parallel (as tabulated below in Table no. 1). To avoid the overloading of running ICT, it is important to curtail the load (which is higher than 347 MVA) running through these ICTs.

Table no. 1:

Sample Calculation of Designing SPS for ICTs:-

		Single ICT Rating	
ICT Rating	**MVA**	**315**	
Overload capacity	**%**	**10**	
Overload Rating	**MVA**	**347**	
No. of ICTs in Parallel	**Total Transformation Capacity**	**Permissible loading per ICT satisfying N-1 criteria**	**Total load on remain ICT under 1 contingency**
2	**630**	**174**	**347**

The SPS would shed load in groups depending on no. of ICTs in operation. In order to achieve it, loads for shedding by SPS would be divided into number of groups. The no. of groups would be one less than the no. of transformers operating in parallel. Therefore in case of 400KV S/stn Deepalpur where 2 no. ICTs are installed, load shedding will be done in one group only.

The present maximum load observed on ICTs at 400KV S/Stn Deepalpur is 250 MVA each that makes 500 MVA on both the ICTs. In such a scenario total load of 153 MVA needs to be shed considering 10% overload capacity of the running ICT. The SPS to be installed should work in such a manner that load must be shed before initiation of overload relay on running ICT. Such load shedding criteria is detailed as below:-

Table no. 2:

Sr. no.	Load shedding required	Load shedding will be achieved as below		
		SPS to be installed at	Load	Total load shedding
1	153 MVA	132 kV Incomers of 220/132KV, 100MVA T-3 and T-4 T/F at 400KV S/Stn Deepalpur	85+85 MVA	170 MVA

Elaboration:

This scheme will operate when one ICT trips and total load on both ICTs is higher than 347 MVA i.e. 10% overload capacity of running ICT. In that case desired load will be shed by switching off the equipment's as tabulated in table no.2. Implementation of this scheme requires to install 2 no. load protection relays on incomers and single initiation scheme at 400 KV Deepalpur which needs to be done through the contractors having expertise in such schemes and working in power grid.

The ultimate area that will be affected in operation of SPS is detailed as below:-

i. Supply of all the 132KV lines running from 400KV S/Stn Deepalpur will be affected which include further 33kV S/Stns as below:

a. 132kV Khewra :- 33kV Khewra, 33kV HUL and 33kV Jakholi
b. 132kV Rai:- local load of 11kV feeders running from 132KV S/stn Rai and

33kV Rai, 33kV safiabad, 33kV Barota, 33kV Nara and 33kV Ansal

c. 132KV Tajpur :- 33kV Ladsoli, 33kV Nandnaur, 33kV Tajpur, 33KV Hasanpur, 33kV Solid waste
d. 132KV HSIIDC Kundli:- local load of 11kV feeders running from 132KV S/stn HSIIDC Kundli and 33kV NIFTEM, 33kV HSIIDC Kundli

3. **Remarks:**

i. Whenever SPS operates at above detailed S/Stn, then it must be ensured that no feeder be energized or its load be shifted to any another source without consent of SLDC Panipat.
ii. Tripping of 132kV incomers of 220/132KV, 100MVA T/F's may not be considered for calculation of TSA as tripping will occur for the safety of the Grid.

The above mentioned SPS scheme for attaining N-1 contingency for enhancement of ATC / TTC for Haryana State was discussed and deliberated by the committee constituted for the purpose in its meeting held on 30.09.2021 in the chamber of CE/SO & Commercial, HVPNL, Panchkula and accordingly, the proposal regarding installation of SPS was sent to UHBVNL for their consent and the consent of UHBVNL has been received on NP-6.

The complete status position was again apprised to all committee members and discussed in detail during a meeting held on 17.11.2021 in the chamber of CE/SO & Commercial, HVPNL, Panchkula and SE/SO & SLDC, HVPNL, Panchkula was requested for apprising the status position regarding installation of SPS by HVPNL to NRLDC. On NP-6 & 7, it has been desired by SO & SLDC wing that SPS scheme proposed to be implemented at 400 KV S/Stn Deepalpur be got approved from competent authority of HVPNL so that accordingly SE/Design may be requested to supply Specifications for the same.

In view of above, the SPS scheme discussed at NP-1 to 3 duly consented by System Operation wing of UHBVNL is submitted for kind consideration and approval from WTDs of HVPNL for taking further necessary action regarding installation of SPS at 400 KV S/Stn Deepalpur for enhancement of ATC/TTC limits of Haryana State please.

Submitted please.

Annexure -4.pdf

15/12/2021 10:07 AM

VARUN KUKNA
(SSE/132KV PTPS PNP)

Note No. #2
May kindly peruse Note#1

The SPS scheme placed at Page#5to11 and duly consented by System Operation wing of UHBVNL is submitted for kind consideration and approval from WTDs of HVPNL for taking further necessary action regarding installation of SPS at 400 KV S/Stn Deepalpur for enhancement of ATC/TTC limits of Haryana State please.

Submitted Please.

15/12/2021 2:05 PM

RAJESHWAR PARSAD
(XEN/TS PNP)

Note No. #3

The SPS scheme discussed at Page#5to11 duly consented by System Operation wing of UHBVNL is submitted for kind consideration and approval from WTDs of HVPNL for taking further necessary action regarding installation of SPS at 400 KV S/Stn Deepalpur for enhancement of ATC/TTC limits of Haryana State please.

Submitted as above

16/12/2021 5:12 PM

B S DAHIYA
(SE/TS RTK)

Note No. #4

May kindly get it examined from SLDC 'OP'please.

22/12/2021 1:34 PM

KULDEEP SINGH
(CE/TS PKL)

Note No. #5

22/12/2021 2:50 PM

SUNIL SETHI
(CHIEF ENGG/SO&COMM)

Note No. #6

22/12/2021 3:03 PM

C.D. SANGWAN
(SE/SLDC OP)

Note No. #7

23/12/2021 10:47 AM

JAI RAM
(XEN/SLDC OP)

Note No. #8

File may please be sent to the O/o XEN/LDPC, HVPNL, Panipat, as that office is looking after the system operation activity on real time basis & ATC/TTC is being calculated by them.

Submitted please.

23/12/2021 10:53 AM

HEM JOSHI
(AEE/SLDC OP)

Note No. #9

23/12/2021 1:43 PM

JAI RAM
(XEN/SLDC OP)

Note No. #10

23/12/2021 2:08 PM

NARESH KUMAR MAKKAR
(XEN/LD&PC)

Note No. #11

As mentioned in Note#1, the proposed SPS scheme was also discussed and deliberated in committee meeting constituted for enhancement of ATC/TTC for Haryana State held on dated 30.09.2021 & 17.11.2021. It seems that the proposed SPS scheme submitted by TS wing for attaining N-1 contingency of ICTs at 400kV substation Deepalpur is in order. However, the approval of competent authority of HVPNL may be taken for further submission of the scheme to NRPC for final approval accordingly.

Submitted Please.

27/12/2021 4:09 PM

ARUN KUMAR
(AEE/LD&PC)

Note No. #12

27/12/2021 4:12 PM

NARESH KUMAR MAKKAR
(XEN/LD&PC)

Note No. #13

27/12/2021 5:18 PM

C.D. SANGWAN
(SE/SLDC OP)

Note No. #14

Please peruse note#11 of AEE/LD&PC and send the file to TS wing for further necessary action.

28/12/2021 11:14 AM

JAI RAM
(XEN/SLDC OP)

Note No. #15

As deliberated above, the proposed SPS scheme is in order and the file may be sent to CE/TS HVPN Panchkula for taking necessary approval please.

28/12/2021 11:40 AM

C.D. SANGWAN
(SE/SLDC OP)

Note No. #16

28/12/2021 1:12 PM

SUNIL SETHI
(CHIEF ENGG/SO&COMM)

Note No. #17

28/12/2021 6:35 PM

KULDEEP SINGH
(CE/TS PKL)

Note No. #18

29/12/2021 2:08 PM

B S DAHIYA
(SE/TS RTK)

Note No. #19

31/12/2021 11:54 AM

RAJESHWAR PARSAD
(XEN/TS PNP)

Note No. #20

Subject: - Proposal for implementation of Special Protection Scheme at 400KV S/Stn Deepalpur for increase of ATC/TTC limits of Haryana state.

Chief Engineer / SO & Comml, HVPNL, Panchkula vide his office memo no. Ch-81/PC-73/SLDC/'OP' dated 15.09.2021 **(placed at Annexure-1)** intimated that a proposal for enhancement of ATC/TTC for the month of September 2021, up to 8771MW, was submitted to Northern Region Load Dispatch Center (NRLDC). However, NRLDC has not allowed to increase the ATC/TTC limits of Haryana state beyond 7840MW / 8500 MW till the N-1 contingency of 400/220KV Deepalpur ICTs is not attended. A committee of officers were formed by worthy Director / Technical, HVPNL, Panchkula conveyed vide XEN / SLDC / OP, HVPNL, Panchkula office memo no. ch-85/PC-73/SLDC/OP dated 22.09.2021 **(placed at Annexure-2)** to ensure the timely action on the issues suggested by NRLDC for enhancement of ATC/TTC limits for Haryana State. In continuation of the same, a draft technical proposal for implementation of SPS at 400KV S/Stn Deepalpur to attain N-1 contingency for 400/220KV Deepalpur ICTs is designed and elaborated as below:

400KV S/Stn Deepalpur has installed capacity of 2x315MVA, 400/220KV ICTs + 2x100 MVA, 220/132KV T/Fs. As per NRPC guidelines as well as Haryana Grid Code, all the Transmission System designed in the state should meet the N-1 contingency criteria. However, the 400/220KV ICTs at 400KV S/Stn Deepalpur does not fulfill the criteria of N-1 contingency. The

purpose of implementation of Special Protection Scheme (herein after called as SPS) at 400KV S/Stn Deepalpur is to make the 400/220kV ICT-1&2 N-1 compliant, till the augmentation of already installed ICTs or installation of additional ICT.

1. **Scope for SPS at 400KV S/Stn Deepalpur:-**

   The purpose of N-1 contingency is to save the power equipment's from tripping when one power equipment in the same loop gets tripped. In the case of 400 KV S/stn Deepalpur, 2 x 315 MVA ICTs are running in parallel and one ICT have to take the load of another in case of tripping of any one. In such scenario, the ICT that remains in service should not trip on overloading if other ICT trips and fulfills the criteria of N-1 contingency. By installing SPS, N-1 criteria can be achieved at 400KV S/Stn Deepalpur.

2. **How N-1 contingency criteria can be achieved at 400KV S/Stn Deepalpur:-**

   To achieve the N-1 contingency, it is important that if one 315 MVA ICT trips then load on other ICT should not be higher than 347 MVA (10% above full load capacity) as per NRPC approved schemes (**SPS related to overloading of Transformers placed at Annexure-3**) for curtailing loads when 2 no. ICTs are running in Parallel (as tabulated below in Table no. 1). To avoid the overloading of running ICT, it is important to curtail the load (which is higher than 347 MVA) running through these ICTs.

Table no. 1:

Sample Calculation of Designing SPS for ICTs:-

		Single ICT Rating
ICT Rating	**MVA**	**315**
Overload capacity	**%**	**10**
Overload Rating	**MVA**	**347**

No. of ICTs in Parallel	**Total Transformation Capacity**	**Permissible loading per ICT satisfying N-1 criteria**	**Total load on remain ICT under 1 contingency**
2	**630**	**174**	**347**

The SPS would shed load in groups depending on no. of ICTs in operation. In order to achieve it, loads for shedding by SPS would be divided into number of groups. The no. of groups would be one less than the no. of transformers operating in parallel. Therefore in case of 400KV S/stn Deepalpur where 2 no. ICTs are installed, load shedding will be done in one group only.

The present maximum load observed on ICTs at 400KV S/Stn Deepalpur is 250 MVA each that makes 500 MVA on both the ICTs. In such a scenario total load of 153 MVA needs to be shed considering 10% overload capacity of the running ICT. The SPS to be installed should work in such a manner that load must be shed before initiation of overload relay on running ICT. Such load shedding criteria is detailed as below:-

Table no. 2:

Sr. no.	**Load shedding required**	**Load shedding will be achieved as below**		
		SPS to be installed at	**Load**	**Total load shedding**
1	153 MVA	132 kV Incomers of 220/132KV, 100MVA T-3 and T-4 T/F at 400KV S/Stn Deepalpur	85+85 MVA	170 MVA

Elaboration:

This scheme will operate when one ICT trips and total load on both ICTs is higher than 347 MVA i.e. 10% overload capacity of running ICT. In that case desired load will be shed by switching off the equipment's as tabulated in table no.2. Implementation of this scheme requires to install 2 no. load protection relays on incomers and single initiation scheme at 400 KV Deepalpur which needs to be done through the contractors having expertise in such schemes and working in power grid.

The ultimate area that will be affected in operation of SPS is detailed as below:-

i. Supply of all the 132KV lines running from 400KV S/Stn Deepalpur will be affected which include further 33kV S/Stns as below:

a. 132kV Khewra :- 33kV Khewra, 33kV HUL and 33kV Jakholi
b. 132kV Rai:- local load of 11kV feeders running from 132KV S/stn Rai and 33kV Rai, 33kV safiabad, 33kV Barota, 33kV Nara and 33kV Ansal
c. 132KV Tajpur :- 33kV Ladsoli, 33kV Nandnaur, 33kV Tajpur, 33KV Hasanpur, 33kV Solid waste
d. 132KV HSIIDC Kundli:- local load of 11kV feeders running from 132KV S/stn HSIIDC Kundli and 33kV NIFTEM, 33kV HSIIDC Kundli

3. **Remarks:**

i. Whenever SPS operates at above detailed S/Stn, then it must be ensured that no feeder be energized or its load be shifted to any another source without consent of SLDC Panipat.
ii. Tripping of 132kV incomers of 220/132KV, 100MVA T/F's may not be considered for calculation of TSA as tripping will occur for the safety of the Grid.

The above mentioned SPS scheme for attaining N-1 contingency for enhancement of ATC / TTC for Haryana State was discussed and deliberated by the committee constituted for the purpose in its meeting held on 30.09.2021 in the chamber of CE/SO & Commercial, HVPNL, Panchkula and accordingly, the proposal regarding installation of SPS was sent to UHBVNL for their consent and the consent of UHBVNL has been received on NP-6.

The complete status position was again apprised to all committee members and discussed in detail during a meeting held on 17.11.2021 in the chamber of CE/SO & Commercial, HVPNL, Panchkula and SE/SO & SLDC, HVPNL, Panchkula was requested for apprising the status position regarding installation of SPS by HVPNL to NRLDC. On NP-6 & 7, it has been desired by SO & SLDC wing that SPS scheme proposed to be implemented at 400 KV S/Stn Deepalpur be got approved from competent authority of HVPNL so that accordingly SE/Design may be requested to supply specifications for the same.

Accordingly, budgetary offer for implementation of SPS scheme at 400 KV S/Stn., Deepalpur for enhancement of ATC/TTC limits of Haryana state, as discussed above has been submitted by M/s Synergy Systems & Solutions (**placed at Annexure-4**).

In view of above, the SPS scheme discussed at NP-1 to 3 duly consented by System Operation wing of UHBVNL and HVPNL is submitted for kind consideration and approval from WTDs of HVPNL for taking further necessary action regarding installation of SPS at 400 KV S/Stn Deepalpur for enhancement of ATC/TTC limits of Haryana State at an estimated expenditure of Rs. 19,20,536.00 (**Rs. Nineteen Lakhs twenty thousand five hundred and thirty six only**).

Submitted please.

07/01/2022 4:56 PM

VARUN KUKNA
(SSE/132KV PTPS PNP)

Note No. #21
May kindly peruse Note#20

The SPS scheme placed at Page#5to11 and duly consented by System Operation wing of UHBVNL and HVPNL is submitted for kind consideration and approval from WTDs of HVPNL for taking further necessary action regarding installation of SPS at 400 KV S/Stn., Deepalpur for enhancement of ATC/TTC limits of Haryana State at an estimated expenditure of Rs 19,20,536.00 (**Rs. Nineteen Lakhs Twenty Thousand Five Hundred and Thirty Six Only**).

Submitted Please.

07/01/2022 5:07 PM

RAJESHWAR PARSAD
(XEN/TS PNP)

Note No. #22

07/01/2022 5:47 PM

B S DAHIYA
(SE/TS RTK)

Note No. #23
May please peruse Note # 21

The SPS scheme placed at Page#5to11 and duly consented by System Operation wing of UHBVNL and HVPNL is submitted for kind consideration and

approval from WTDs of HVPNL for taking further necessary action regarding installation of SPS at 400 KV S/Stn., Deepalpur for enhancement of ATC/TTC limits of Haryana State at an estimated expenditure of Rs 19,20,536.00 (**Rs. Nineteen Lakhs Twenty Thousand Five Hundred and Thirty Six Only**).

Submitted please.

07/01/2022 5:58 PM

NAVEEN CHAUHAN
(AEEWORKS/SETSRTK)

Note No. #24

Proposal at Note#20 duly consented by System Operation wing of UHBVNL and HVPNL regarding installation of SPS at 400 KV S/Stn., Deepalpur for enhancement of ATC/TTC limits of Haryana State at an estimated expenditure of Rs 19.21 (approx.) is submitted for consideration and approval from WTDs of HVPNL please.

07/01/2022 6:06 PM

B S DAHIYA
(SE/TS RTK)

Note No. #25

10/01/2022 11:32 AM

KULDEEP SINGH
(CE/TS PKL)

Note No. #26

10/01/2022 2:40 PM

S.K. AGGARWAL
(CFO)

Note No. #27

10/01/2022 3:01 PM

ARCHANA TALWAR
(FA/HQ)

Note No. #28

The concerned office may place on record the following before sending the

case to the WTDs for consideration:

1. The reasonability of rates offered by M/s Synergy Systems & Solutions with comparison of rates from the similar job done by other firm or agency for HVPNL any other Utility.
2. Funding of the said work is also require to be included in the proposal.

11/01/2022 12:03 PM

SANJAY MINOTRA
(SR. AO/BUDGET)

Note No. #29

11/01/2022 1:06 PM

ARCHANA TALWAR
(FA/HQ)

Note No. #30

11/01/2022 3:22 PM

S.K. AGGARWAL
(CFO)

Note No. #31

14/01/2022 12:29 PM

KULDEEP SINGH
(CE/TS PKL)

Note No. #32

19/01/2022 10:06 AM

D.P. TIWARI
(DIRECTOR/FINANCE)

Note No. #33

19/01/2022 12:19 PM

T. L. SATYAPRAKASH IAS
(MANAGING DIRECTOR)

Note No. #34

19/01/2022 12:27 PM

SUNIL SETHI
(CHIEF ENGG/SO&COMM)

Note No. #35

19/01/2022 3:32 PM

KULDEEP SINGH
(CE/TS PKL)

Note No. #1 -1- Attachment:Annexure -4.pdf

Subject: Technical proposal for implementation of Special Protection Scheme at 400KV S/Stn Deepalpur.

Chief Engineer, SO & Comml, HVPNL, Panchkula vide his office memo no. ch-81/PC-73/SLDC/'OP' dated 15.09.2021 **(Placed at Annexure-1)** intimated that a proposal for enhancement of ATC/TTC for the month of September 2021, up to 8771MW, was submitted to Northern Region Load Dispatch Center (NRLDC). However, NRLDC has not allowed to increase the ATC/TTC limits of Haryana state beyond 7840MW / 8500 MW till the N-1 contingency of 400/220KV Deepalpur ICTs is not attended. A committee of officers were formed by worthy Director / Technical, HVPNL, Panchkula conveyed vide XEN / SLDC / OP, HVPNL, Panchkula office memo no. ch-85/PC-73/SLDC/OP dated 22.09.2021 **(Placed at Annexure-2)** to ensure the timely action on the issues suggested by NRLDC for enhancement of ATC/TTC limits for Haryana State. In continuation of the same, a draft technical proposal for implementation of SPS at 400KV S/Stn Deepalpur to attain N-1 contingency for 400/220KV Deepalpur ICTs is designed and elaborated as below:

400KV S/Stn Deepalpur has a capacity of 2x315MVA, 400/220KV ICTs + 2x100 MVA, 220/132KV T/Fs. As per NRPC guidelines as well as Haryana Grid Code, all the Transmission System designed in the state should meet the N-1 contingency criteria. However, the 400/220KV ICTs at 400KV S/Stn Deepalpur does not fulfill the criteria of N-1 contingency. The purpose of implementation of Special Protection Scheme (Herein after called as SPS) at 400KV S/Stn Deepalpur is to make the 400/220kV ICT-1&2 N-1 compliant, till the augmentation of already installed ICTs or installation of additional ICT.

1. **Scope for SPS at 400KV S/Stn Deepalpur:-**

The purpose of N-1 contingency is to save the power equipment's from tripping when one power equipment in the same loop gets tripped. In the case of 400 KV S/stn Deepalpur, 2 x 315 MVA ICTs are running in parallel and one ICT have to take the load of another in case of tripping of any one. In such scenario, the ICT that remains in service should not trip on overloading if other ICT trips and fulfills the criteria of N-1 contingency. By installing SPS, N-1 criteria can be achieved at 400KV S/Stn Deepalpur.

2. **How N-1 contingency criteria can be achieved at 400KV S/Stn Deepalpur:-**

To achieve the N-1 contingency, it is important that if one ICT trips then load on other ICT should not be higher than 347 MVA (10% above full load capacity) as per NRPC approved schemes (**SPS related to overloading of Transformers placed at Annexure-3**) for curtailing loads when 2 no. ICTs are running in Parallel (as tabulated below in Table no. 1). To avoid the overloading of running ICT, it is important to curtail the load (which is higher than 347 MVA) running through these ICTs.

Table no. 1:

Sample Calculation of Designing SPS for ICTs:-

		Single ICT Rating	
ICT Rating	**MVA**	**315**	
Overload capacity	**%**	**10**	
Overload Rating	**MVA**	**347**	
No. of ICTs in Parallel	**Total Transformation Capacity**	**Permissible loading per ICT satisfying N-1 criteria**	**Total loading on remaining ICT under N-1 contingency**
2	**630**	**174**	**347**

Note No. #1

Attachment:Annexure -4.pdf

The SPS would shed load in groups depending on no. of ICTs in operation. In order to achieve it, loads for shedding by SPS would be divided into number of groups. The no. of groups would be one less than the no. of transformers operating in parallel. Therefore in case of 400KV S/stn Deepalpur where 2 no. ICTs are installed, load shedding will be done in one group only.

The present maximum load observed on ICTs at 400KV S/Stn Deepalpur is 250 MVA each that makes 500 MVA on both the ICTs. In such a scenario total load of 153MVA needs to be shed considering 10% overload capacity of the running ICT. The SPS to be installed should work in such a manner that load must be shed before initiation of overload relay on running ICT. Such load shedding criteria is detailed as below:-

Table no. 2:

Scheme no.	Load shedding required	Load shedding will be achieved as below		
		SPS to be installed at	Load	Total load shedding
1	153 MVA	132kV Incomers of 220/132KV, 100MVA T-3 and T-4 T/F at 400KV S/Stn Deepalpur	85+85 MVA	170 MVA

Elaboration:

This scheme will operate when one ICT trips and total load on both ICTs is higher than 347 MVA i.e. 10% overload capacity of running ICT. In that case desired load will be shed by switching off the equipment's as tabulated in table no.2. Implementation of this scheme requires to install 2 no. load protection relays on incomers and single initiation scheme at 400 KV Deepalpur which needs to be done through the contractors having expertise in such schemes and working in power grid.

The ultimate area that will be affected in operation of scheme no. 1 is detailed as below:-

i. Supply of all the 132KV lines running from 400KV S/Stn Deepalpur will be affected which include further 33kV S/Stns as below:

   a. 132kV Khewra :- 33kV Khewra, 33kV HUL and 33kV Jakholi
   b. 132kV Rai:- local load of 11kV feeders running from 132KV S/stn Rai and 33kV Rai, 33kV safiabad, 33kV Barota, 33kV Nara and 33kV Ansal
   c. 132KV Tajpur :- 33kV Ladsoli, 33kV Nandnaur, 33kV Tajpur, 33KV Hasanpur, 33kV Solid waste
   d. 132KV HSIIDC Kundli:- local load of 11kV feeders running from 132KV S/stn HSIIDC Kundli and 33kV NIFTEM, 33kV HSIIDC Kundli

3. Remarks:

i. Whenever SPS operates at any above detailed S/Stn, then it must be ensured that no feeder be energized or its load be shifted to any another source without consent of SLDC Panipat.

ii. Tripping of 132kV incomers of 220/132KV, 100MVA T/F's may not be considered for calculation of TSA as tripping is occurred for the safety of the Grid.

Note No. #1 Attachment:Annexure -4.pdf

-3-

In view of the position explained above, following is submitted for approval from competent authority of HVPNL and UHBVNL for further submission to NRPC:

i. Technical approval for installation of above detailed scheme at S/stns tabulated above in table no. 2.

ii. Approval for disruption in power supply to the area as detailed in scheme tabulated above in table no. 2.

Submitted please.

6/10/21

Er. Rajeshwar Sharma
XEN / TS Div.
HVPNL, Panipat

SE / TS, Circle, Rohtak

May please consent for installation of SPS pl.

6/x/2021
(Er. B. S. Dahiya)
SE / TS Rohtak.

SE/ op. Sonipat

May pl. be taken up with competent authority of UHBVN for necessary consent etc.

8/x/2021
(SANDEEP JAIN)
SE op UHBVN, Sonepat

SE/TS, Rohtak

May take up the matter with consent of UHBVNL authorities please.

12/x/2021
(B.S. Dahiya)
SE/TS Rohtak

CE/TS Panchkula

May kindly take up matter with CE/HPPC to examine and approve the scheme pl.

(KULDEEP SINGH) 12/10/21
CE/TS PKL

CE/SO-S Commercial

12.X.2021

SE/SLDC OP

13/x/21

XEN/SLDC (OP)

14/x/21

AEE/SLDC/op

CR.77/CCSB-64/Vol.II/CETS/PKL.
13.10.2021

DIARY No. 55...
CE/S.O. & COMML
HVPNL PANCHKULA
Date. 13.10.2021

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Note No. ~~#1~~ F.P.P -4- Attachment:Annexure -4.pdf

The consent/approval from UHBVN needs to be taken from CE/SO, UHBVN and not from CE/HPPC, as HPPC relates with Power Purchase.

The file may please be sent to the concerned committee member constituted by Director/Technical (Annex-2) for taking consent from UHBVN and competentent authority of HVPN for further submission to NRPC.

Submitted please.

(Er. B. S. Dahiya) SE / TS Rohtak

Joshi 18/10/21 AEE/SLDC/OP

XEN/SLDC/OP

Please send the file back to SE/TS Rohtak for taking further necessary action.

SE/SLDC/OP

19/X/21

CE/SO UHBVN

19/10/2021 Rajesh Goel SE/STU.

Pl. discuss

19.10.2021

SE/SLDC OP

19/10/2021

Xen/SLDC OP

In the meeting held on dated 30.8.21, in the chamber of CE/SO & Comml. it was decided that TS wing will submit the SPS scheme completed in all respect for approval from NRPC. As such, CE/TS, HVPN, Panchkula may please be requested to take up the matter with UHBVNL and finalize the scheme for approval from NRPC by this office.

SE/SLDC/OP

21/X/21

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FPP.

The file may be sent to CE/TS Panchkula for further action please.

Sd/- 21/X/21

CE/SO & Commercial.

Sd/- 21.X.2021

DIARY NO. 55 DATED 21.10.2021 CE/SO & COMML.HVPNL

O. CE/TS, Panchkula

2414/Works 22/10/2021

SE/TS Rohtak

Sd/- 22/10/21

File may please be sent to CE/SO, UHBVNL, Panchkula for consent/Approval of UHBVNL. The SPS scheme has already been prepared and discussed at NP-1 to 3 pl. cases.

Sd/- 22/X/2021
(B.S. Dahiya)
SE/TS, Rohtak.

CE/TS, Panchkula

CF.78/CCSB-64/Vol.II/CETS/PKL. 22.10.2021

CE/SO/UHBVNL

Sd/- 22/10/2021

SE/SO

Sd/- 22/X/2021

Sd/-

As on NP-3, Approved for disruption of Power supply in Area from 400 KV S/Stn Deepalpur is sought. This area falls under OP Sonepat circle, HVPN RTK and SO wing has no concerned. May file be forwarded to take comments of 'OP' wing Pl.

Sd/- 27/10/21

CE/SO. Pl. discuss

Sd/- 27/X/2021

SE/SO

Xen/SO. Sd/- 2/11/21

P.T.O. →

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Note No. #1 Attachment:Annexure -4.pdf

SO Wing has noted the area likely to be affected when the SPS is operated.
SO Wing is not the competent authority to approve the same and there is no such precedence of SO Wing giving approval for such operations on behalf of UHBVN for the SPS already in operation, please.

3/11/2021
XEN/SO

CE/SO As above, Noted for area effected and May Request to expidite installation of SPS pl.
3/11/21

1060/CESO/UH
07/11/2021

CE/SO.

CE/TS, Panchkula (HVPNL)

3/11/2021

2605/Weekly 08/11/2021

The comments has been received from CE/SO UHBVNL. May deal it accordingly in context of increasing the limits of ATC/TTC for Haryana State pl

SE/TS Rohtak

8/11/21

Ch-83/CCSB-64/Vol-II/CETS/PKL 08.11.2021

For f.n. pl.

File recd on 17.11.2021

XEN/TS, PNP

18/XI/2021
SE/TS, Rohtak

For increasing the limits of ATC/TTC for Haryana State, SE/Design be requested for supplying the technical specifications of SPS as per scheme discussed at NP-1 & 2 & SE/SLDC 'OP' HVPNL Panchkula be requested for apprising of status regarding SPS to NRLDC.

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Note No. #1 **Attachment:Annexure -4.pdf**

-7-

Accordingly file be sent to SE/SLDC 'OP' HVPNL Panchkula for further necessary action please.

23/11/21
XEN TS HVPN PANIPAT.

SE/TS HVPN ROHTAK.

23/11/21
(Er. B. S. Dahiya)
SE / TS Rohtak.

Ch. 135/TCW-552 dt. 23.11.2021

SE/SLDC 'OP' Panchkula.

25/11/21

XEN/SLDC (OP)

The slides of the SPS scheme Noted. However, SE/TS HVPN Rohtak may be requested to supply SPS scheme duly approved from the competent authority of HVPN for consideration/approval of NRPC.

file may please be send to SE/TS Rohtak for further necessary action regarding installation of SPS scheme.

DIARY No. 1115
SE/SLDC/'OP'
DATED 25/11/2021

Jai Ram
XEN/SLDC 'OP'
25/11/21

CD Sangwan
SE/SLDC/OP
25/11/21

SE/SLDC/OP

SE/TS HVPN Rohtak
for info pl.

1/12/2021
(Er. B. S. Dahiya)
SE / TS Rohtak.

XEN/TS, Panipat

Ch 136/TCW-552 dt. 01.12.2021

HARYANA VIDYUT PRASARAN NIGAM LIMITED Tel. 0180-2652978
(Regd. office: Sector-6 Shakti Bhawan, Panchkula) Fax.0180-2652978
Executive Engineer Mobile- 09315353640 e-mail:xentspnp@hvpn.gov.in
Transmission System Division Panipat- 132103

Work Order No: -220 /WO-5/2021-22/Vol-V Dated:- 15/3/2022

To

M/s. Synergy System & Solutions,
A-1526Green fields colony , Faridabad-121001

Sub: Work order for Installation of Special Protection Schome at 400 KV S/Stn. Deepalpur.

In reference to your quotation received against E NIT.no. 55/TS/Div/PNP\2021-22 dated 14.2.2022 and opened on dated 14.2.2022 and negotiation held in the office of CE TS HVPNL, Panchkula cum chairman and committee on dated 10.3.2022. Your negotiated rate has been accepted by the committee i.e. 9.0% above nine point zero percent) above on estimated cost i.e. Rs. 1415281.00+127375.29 =1542656.29+GST extra @18%.. So you are here by authorized to execute the subject cited work as per following scope of work along with terms and conditions:-

Sr. No.	Job Description	Qty	Negotiated Rate	Total amount
1	Installation of Special Protection Scheme at 400 KV S/Stn. Deepalpur.	As per scope of work contained in the NIT	estimated cost + 9.0 % above on estimated cost +GST extra @18%	1415281.00 +127375.29
	Net Total (Exclusive GST)			1542656.29
	GST @ 18%			277678.13
	Total Including GST			1820334.42

erms & Conditions:-The Firm shall strictly follow the terms and conditions given here under for the works.

1. **SCOPE OF WORK:-**The details of the work to be executed (as mentioned above in "name of work") should be under stood by the contractor and they may visit the site to get detail in this connection. HVPNL has the right to increase or decrease the quantum of work at any stage to any extend for which no claim will be entertained.

2. **SAFETY:-**i.)The contractor shall make all the arrangements for the safety of his staff. The HVPNL shall not be responsible in any way for injury /disablement, accident to any work man on this account and will be free from any legal dispute in this regard HVPNL will not be responsible to pay any damage to the work man of the contractor or any outside agencies.
   ii) Contractor shall take necessary steps to ensure the safety of HVPNL property and shall be responsible for all such damages and shall have to repair or replace as the case may be, failing which he has to pay the entire cost of damages.
   iii) Before carrying out the work, it shall be entire responsibility of the contractor to take all the safety precautions and shut down etc. if required during the execution of work, all shut down will be taken by HVPNL supervisory staff on required of contractors representative in writing and one day advance.
   iv) The work has to be carried out according to the Specifications/drawing given, where not, according to the satisfaction of HVPNL representatives.
   v) Contractor shall be required to strictly adhere the safety regulations and electrical regulations as per electricity act.
   vi) During Transportation of departmental material, if any the contractor shall strictly observe the regulations as laid down by traffic police, any damage to HVPNL property/material during the course of transportation shall be recovered from the contractor's bill.
   Vii) Any type of theft /pilferage of material after handing over of same to contractor will be responsibility of the contractor, and any such loss if occurred the amount of same will be deducted from the bills.
   Viii) The contractor shall abide by the labour laws applicable to state of Haryana with amendments from time to time by govt. of Haryana and shall produce the valid Civil/Electrical Work License to HVPNL in charge executing work before commencement of work.
   IX) No labor below the age of 18 years and above 62 years shall be deployed on the works. The contractor shall allow weekly rest as per labour act without extra charges to the Nigam on this account.
3. **PAYMENT**:-The payment shall be made RTGS/NEFT through SBI Panipat after satisfactory completion of the service job within 15 days, Income tax and other applicable taxes will be deducted at source if applicable.
4. **SSE 132 KV s/stn PTPS** to supply the complete detail of the work executed along with the bills and payment shall be made strictly as per the executed work only
5. The work shall be got executed by **SSE 132 KV s/stn PTPS** strictly as per provision in the under sanction and shall not exceed without approval of competent authority and actual measurement of work shall be in bills.
6. The work will be carried out by the contractor under the supervision of Je in charge and finally the work will be complete to the entire satisfaction of **SSE 132 KV s/stn PTPS**
7. If the service job is not completed within the stipulated period i.e. **180 Days (one hundered & eighty days)** from date of issue of work order. This office reserve the right to get the work executed departmentally or any outside agency at the risk and cost of contractor without assigning any reason.
8. **Force Majeure:-**The Supplier shall not be liable for any loss or damages due to delay in manufacture or delivery of the material for reason arising out of compliance with regulations, orders or instructions of central /state Govt. of natural calamities like fires, floods Acts of Civil & military authorities strike, lock outs freight, Embargoes, war risks, riots and civil commotion as well as non-availability of Shut down at Nigam System and availability of equipment
9. **PENALTY**:-A token penalty of 1/2% per week of period of delay subject to maximum of 10% of the unexecuted portion of the contractor would be levied in case of delay in execution of the work beyond the stipulated completion period of extension if any, granted to them by the HVPNL authority.
10. The contractor has to be execute the work on working days during the working hours, However ,if required, the work can be executed on holidays, under special circumstances, with prior permission of Engineer in charge.
11. The deviation limit for the work shall be ±20% of the total value of contract awarded and even items can be deleted/added as per site requirements. The payment will be regulated as per work measurement done by the JE in charge and respective **SSE 132 KV s/stn PTPS**

12. **ARBITRATION**:-If the dispute question or controversy arises, the settlement which is not therein specially provided between the HVPNL and the contractor relating to this contract or the portion of the same or the right or duty's or liabilities of either party then in every such case, the matter in dispute shall be referred to the arbitration of the chairman or his nominee and the decision of the chairman of his nominee shall be final and binding on both the parties. The provisions of Indian arbitration Act, 1940 as amended from the time to time shall be applicable to such arbitration proceeding.
13. The work shall be started as per the instruction of executing authority/site in-charge either through special messenger, telegram, or telephonically.
14. The stipulated period completion period has been given in good faith .However the contractor has to complete the work in minimum possible time by providing parallel gangs as per site requirements on the direction of **SSE 132 KV s/stn PTPS** site otherwise poor performance may be recorded.
15. All the required material such as patty and capital material etc. will be arranged by the Nigam and all required Labour, and minor T&P for erection of work will be arranged by the contractor .Transpiration for shifting and caring T&P will be arranged by the Nigam.
16. Any other minor job detail of which is not covered under the scope of work which is required to be done for completion of work will be carried out by the contractor without any extra cost.
17. Inspection of the work done will be carried out by **SSE 132 KV s/stn PTPS** and any observation pointed out regarding executed work at the time of inspection will have to be attended by the contractor without any extra cost.
18. The contractor will provide minor T&P and Labour for completion of the work and no extra payment will be given on this account. However major T&P decide by **SSE 132 KV s/stn PTPS** will be provided by Nigam
19. in case the progress of work does not commensurate with the target date. The part/balance work will be taken out from the contractor and will be allotted to other or do departmentally on the risk and cost of the contactor without giving any notice. The schedule and the pert chart of the work shall be worked out mutually by HVPN and the contractor and the same shall be adhered to.
20. The expenditure will be booked to special estimate for Installation of Special Protection Scheme at 400 KV S/Stn. Deepalpur vide estimate no.CWC-378/2021-22 under GH-14.105
21. **Contractor liable for damage & for imperfect work**:-if any damage shall happen to the work while in progress, from any cause whatever or any imperfection become apparent in it after a certificate of final or of its completion have been given by the Engineer in charge as aforesaid, the contractor shall make the same good or Engineer in charge may make the same good by other workman and deduct the expense from any sum that may be then or at any time thereafter may become due to the contractor or from his security deposit, of which the certificate of the Engineer in charge shall be final.
22. The contract can be terminated without any notice in the event of violation of any of the term & condition of the contract.
23. Taxes: - All type of taxes will be paid/recovered as per Nigam Norms.
24. Work order issued under **revised DOP 30** after pre audited by the Divisional Accountant TS Divn. Panipat.
25. The successful tenderer shall have to execute an agreement on a non-judicial stamp paper of Rs.100/- within 15 days of the receipt of the work order, failing which it shall be presumed that purchase work order along with the its terms & conditions is acceptable to him and shall be binding upon him.

Executive Engineer
TS Divn. HVPNL Panipat

Copy of the above is forwarded to the following for information and necessary action.

1. The CE TS HVPNL, Panchkula for kind information
2. The SE TS Circle,HVPNL Rohtak for kind information
3. AO (A&R) HVPNL Panchkula for kind information.
4. SSE 132 KV s/stn PTPS
5. Divisional Accountant T.S. Division, HVPNL, Panipat

Ann-5

MOM between Synergy Systems and Solutions , HVPNL ,Indigrid at 400KV Deepalpur S/Stn.

Date: 14-May-2022

M/S Synergy systems and Solutions Engineer visited at 400KV Sub-station Deepalpur from 7/5/2022 to 14/5/2022 for Installation, commissioning, Testing of SPS system.

The following work have been completed

1. RTU/PLC panel erection.
2. Control cable laying, termination & Ferruling at both end (CNR, RTU), (AI,DI,DO,AC & DC).
3. OFC communication cable laying , splicing & Ferruling at both end (LIU,RTU).
4. Current Transducers (4 nos) in CNR panel (ICT1, 2, 3&4).
5. CMR relays installation done in ICT3&ICT4 CNR panel.
6. LDMS erection and commissioning done at Control room.

Logics Test Report

X1 = Total Running Load of ICT-1 in Ampere
X2= Total Running Load of ICT-2 in Ampere
910A = Initial Set Point of ICT-1, ICT-2 (10% of full load capacity of ICTs)

Sr. No.	Conditions	Delay in Tripping of ICT LV side	Case	Action	Remarks
1.	If 910A < =X 1 then	0 ms	CASE-1	Tripping of ICT3&4.	OK Tested
2.	If 910A < =X 2 then	0ms	CASE-2	Tripping of ICT3&4.	OK Tested
3.	If 1820A <= X1&X2 then	150 ms	CASE-3	Tripping of ICT3&4.	OK Tested

As per above conditions, we have checked the SPS performance by simulating the ICTs set point load and verified the tripping of ICTs as per define logic in work order by HVPNL.
The ICT's Actual Running load also verified with SCADA (In Ampere 220 KV Side &132 KV side) and found Ok.

Synergy engineer

1. Jitendra Singh 14-05-2022

2. 14/5/2022

HVPNL

SSE/PPS

Indi grid

Siemens

14/5

(MUTHUKRISHNAN)

SIEMENS

220 KV Dipalpur - Sec-6 Ckt-2

Annexure - 6

210_21_1_prn
Indications

SIMATIC

Trip Log - 000517 / 5/29/2022
6:18:19.785 PM - Dipalpur_12OCt21 /

30.05.22 00:06:39

1 Indications

1.1 Trip Log - 000517 / 5/29/2022 6:18:19.785 PM - Dipalpur_12OCt21 / FINAL / 220KV / KIOSK-5 / 210_21.1/7SA611 V04.70.07

Trip Log - 000517 / 5/29/2022 6:18:19.785 PM - Dipalpur_12OCt21 / FINAL / 220KV / KIOSK-5 / 210_21.1/7SA611 V04.70.07

Number	Indication	Value	Date and time	Cause	State
00301	Power System fault	517 - ON	29.05.2022 18:18:19.785		
00302	Fault Event	536 - ON	29.05.2022 18:18:19.785		
01358	E/F picked up FORWARD	ON	0 ms		
01336	E/F phase selector L1 selected	ON	0 ms		
01357	E/F 3I0p PICKED UP	ON	0 ms		
03682	Distance Pickup L1E	ON	5 ms		
03701	Distance Loop L1E selected forward	ON	5 ms		
01335	Earth fault protection Trip is blocked	ON	9 ms		
02784	AR: Auto-reclose is not ready	ON	205 ms		
03805	Distance TRIP command Phases L123	ON	355 ms		
00536	Relay Definitive TRIP	ON	355 ms		
00533	Primary fault current IL1	11.40 kA	359 ms		
00534	Primary fault current IL2	0.29 kA	359 ms		
00535	Primary fault current IL3	0.29 kA	359 ms		
03671	Distance PICKED UP	OFF	423 ms		
03701	Distance Loop L1E selected forward	OFF	423 ms		
01336	E/F phase selector L1 selected	OFF	448 ms		
01345	Earth fault protection PICKED UP	OFF	448 ms		
00511	Relay GENERAL TRIP command	OFF	458 ms		
01123	Fault Locator Loop L1E	ON	314 ms		
01117	Flt Locator: secondary RESISTANCE	0.50 Ohm	314 ms		
01118	Flt Locator: secondary REACTANCE	1.49 Ohm	314 ms		
01114	Flt Locator: primary RESISTANCE	0.62 Ohm	314 ms		
01115	Flt Locator: primary REACTANCE	1.86 Ohm	314 ms		
01119	Flt Locator: Distance to fault	9.4 km	314 ms		
01120	Flt Locator: Distance [%] to fault	170.3 %	314 ms		

Annexure - 7

Minutes of Meeting

Date: 01.06.2022

REF: XEN/LD&PC, HVPN PANIPAT Letter No. . 416 & 418/SO/PNP/PCP-130 (Vol-II) Dated: 30.05.2022

Visited at 400KV S/Stn in Deepalpur dated: 01.06.2022 regarding operation of Special Protection Scheme (SPS) as per above mentioned letter.

The following issues found at 400 KV S/Stn. Deepalpur.

1. The SPS scheme got operated on 29.05.2022 at 18:18hrs under SPS Case-3 (i.e. ICT-1 & ICT-2 both were on load & at fault total running load of ICT's were greater than set point 1820 A and load difference 2832 A.), SPS executed tripping command to **Incomer of ICT-3 & ICT-4 under N-1 contingency .**
2. After analysis, it was observed that time delay provided in SPS logic is on lower side i.e. **150 msec** whereas DPS relays installed on 220 kV Deepalpur-Sec-6 circuit-2 operated in In zone-2, 9.4 KM with heavy fault in red phase (i.e 11.40 KA). **(Copy Enclose-1)**
3. Latest case observed on 220kV Deepalpur-Sec-6 line 2 on which Earth wire broken at tower No.-18 (Total Towers-27) near about 4.0 km but relay cleared this fault in Zone-2. But actually fault was in Zone-1 as per location of fault i.e 4.0 KM. while in DR/EL the fault location is 9.4 KM so M/s Indigrid (400 kV S/Stn. Deepalpur) is advised to verify the zone setting by firm engineer's.
4. DPS relay at 220 Kv s/s Sector-6 did not operate as Bus Coupler at 220 kV S/Stn. Sector-6 was in OFF position at the time of fault and both 220kV ckts were running on individual buses. Protection coupler at 220kV Sec-6 Sonipat was not working due to defective modules which are sent to firm for repair.
5. As per approved SPS scheme, there is no mention any time delay setting to trip under **N-1 contingency.**
6. As discussed with M/s Synergy Engineer, suggested that the tripping time delay (400 msec) for clearing the fault by Distance Protection Relay under Zone-1 & Zone-2.
7. As discussed with M/s Indigrid (400 kV S/Stn. Deeplapur), 400 kV 315 MVA ICT's (ICT-1 & 2) are able to sustain upto 120 % of full load current (i.e 992 A). **(Copy Enclose-2)** M/s Indigid (400 kV S/Stn. Deepalpur) are requested to confirm the over loading of 400 kV ICT's
8. As the SPS scheme is new for HVPN so guidance is required from SLDC for implementation time delay setting in SPS logic for prevent SPS operation during fault condition.

Indra Sniel
SSS / Sr. Project Engi
01/06/2022

SDO MPP RTK

SSE/220kV
Sonepat

Xen MPP
cc RTK

Deepalpur
M/S Indigrid

3.0 PROTECTION SETTINGS AND CALCULATIONS : 220 KV

3.1 400/220 KV;315MVA ICT PROTECTION SETTINGS (BAY NOS. 1& 3 Typical)

3.1.A ICT LV DIRECTIONAL O/C & E/F PROTECTION - 7SJ62 (67LV2/67N)

Relay MLFB 7SJ6222-6EB90-1FD0-LOS

Auto Transformer (ICT) Data :

Rated MVA	=	315	
Transformer Primary Voltage	=	400	KV
Transformer Sec- Voltage	=	220	KV
Tertiary voltage	=	33	KV
% Impedance(Assumed)	=	12.5	
Tap Range of Transformer	=	-10% to+10% in steps of 1.25%	
Total no. of taps	=	17	
Transformer vector group	=	YNa0d11	

Current Transformer Data :

CT Ratio (220KV) - 21CT- Core1 = 1600- 1200-800/1 A
Cl : PS
Vk≥1600-800 V
R_{CT} ≤ 8-4 Ω

A.1 Dir. O/C Protection : (67)

(Direction = Reverse -Into ICT) (Please confirm on the direction)

ICT Full load current on 220KV side = 826.66 A

With Overload 20% = 992 A

The relay curve selected is Standard Inverse.

Pick up setting , I_P = **0.6**

This setting will allow the overload setting of 16.1%

The maximum symmetrical Fault current on 220 Kv bus

Assumed Fault MVA = 10,000 MVA

Max. Fault Current = 10000X1000/(√3X220X0.9)

= 29.16 KA

As this relay, need not have co-ordination with other relays, we propose min. time only.

The min. operating time proposed = 0.3 sec

Time multiplier setting = **0.15**

Actual operating time = 0.297 sec

Phase Ange = **135°**

Annexure - 9

Date: 06-~~May~~ June-2022

MOM between Synergy Systems and Solutions, HVPNL, Indigrid at 400KV Deepalpur.

M/S Synergy systems and Solutions Engineer visited at 400KV Sub-station Deepalpur dated: 06.06.2022 for modifying the SPS logic.

The following changes have been done in SPS logic in presence of HVPNL and IndiGrid.

Logics Test Report

910A = Initial Set Point of ICT-1, ICT-2 (10% of full load capacity of ICTs)

Sr. No.	Conditions	Delay in Tripping of ICT LV side	Case	Action	Remarks
1.	If 910A < =X 1 then	450 ms	CASE-1	Tripping of ICT3&4.	delay 450 ms dated: 06.06.2022
2.	If 910A < =X 2 then	450ms	CASE-2	Tripping of ICT3&4.	delay 450 ms dated: 06.06.2022
3.	If 1820A <= X1&X2 then	1200 ms	CASE-3	Tripping of ICT3&4.	delay 1200 ms dated: 06.06.2022

1. As per suggestion of M/s Indigrid the time delay of 450 msec in Case-1 and Case – 2 is provided keeping in view the special circumstance, i.e. 1 No ICT is in shutdown and fault is observed in one of the lines running from ICT No-2 wherein the fault is sensed in Zone-2 and same should be cleared by Distance protection scheme instead of SPS.
2. The time delay of 1200 msec in Case-3 where both the ICTs are in circuit is provided to ensure tripping in zone -3 should also be actuated through distance protection scheme in case of fault in transmission lines fed through the ICTs instead of SPS.

Synergy engineer

06-06-2022

HVPNL

SSE/PMS

SDO M&P

Indigrid

Regional Mngr.

(VIGNESHWAR)

(Protection Lead)

(JEWEL ROY)

S/S Incharge

Siemens

(MUTHUKRISHNAN)