



NH/Comml./Tariff/29/2024/

24.05.2024

**The Secretary**  
**Central Electricity Regulatory Commission,**  
**7<sup>th</sup> Floor, Tower-B, World Trade Centre**  
**Block-F, Nauroji Nagar, Safdurjung Enclave,**  
**New Delhi- 110 029**  
**Fax: 011-23753923**

**Sub:-Comments on draft Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) Regulations, 2024 - Reg.**


**Ref:- Public Notice No L-1/260/2021/CERC dated 30.04.2024**

Sir,

In reference to above public notice dated 30.04.2024, the comments / suggestions / objections of NHPC on the draft CERC (Deviation Settlement Mechanism and Related Matters) Regulations, 2024 are enclosed for further necessary action. The comments / suggestions / objections have been uploaded through SAUDAMINI portal under 'e-Regulation'. The soft copy of the same has also been emailed to [secy@cercind.gov.in](mailto:secy@cercind.gov.in) and [advisor-re@cercind.gov.in](mailto:advisor-re@cercind.gov.in).

Thanking You,  
**Encl: As above**

Yours Sincerely,

  
**(Ranjeet Thakur)**  
**General Manager (Comml.)**

**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

CERC has notified the draft Central Electricity Regulatory Commission (Deviation Settlement Mechanism and Related Matters) Regulations, 2024 on 30.04.2024. The notified draft Regulation has brought some changes in the existing incentives and disincentives in CERC DSM Regulations 2022, where in instead of having fixed incentive and disincentive in the frequency band, variable rates has been provided based on the frequency.

The Explanatory Memorandum has been issued by Hon'ble CERC. In the EM, one of the reason behind coming up with the draft DSM Regulations 2024 is lower participation in the Ancillary Services

*"The Committee also noted that the DSM was over-incentivizing deviation from scheduled transactions, which could discourage market participants from actively participating in Ancillary Services (AS)"*

Further, in the draft CERC DSM Regulations 2024, Hon'ble CERC while deciding the incentives has provided a rationale

*"4.7 Over injection by general sellers during low frequency is supportive for the grid and hence has been appropriately incentivized while avoiding any over-incentive, in order to encourage participation in Ancillary Service Mechanism....."*

Thus, it can be seen that the aim of new draft DSM regulations 2024 is to encourage more participation in the Ancillary Market by the generators.

NHPC is a Central generating Company having 20 nos operating Hydro Generating Stations on Standalone basis and 2 nos operating Hydro Generating Stations on JV/ Subsidiary mode. Presently the Ancillary Services under CERC Ancillary Regulations 2022 can be provided as Secondary Reserve Ancillary Service (SRAS) and Tertiary Reserve Ancillary Services (TRAS). SRAS is to be provided mandatorily by ROR with Pondage Hydro generating Stations, while TRAS can be provided when there is unscheduled power available with the station which can be committed by the Generator on Day ahead basis in Power Exchange. However, in case of



**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

hydro generating stations there is no unscheduled power which can be committed towards TRAS. Further, even if hydro generating commit some capacity towards TRAS if there is unrequisted power, most hydro generating stations do not have large storage, thus, if their power is not utilized under TRAS, it can lead to water spillage. Thus, the hydro generating stations are providing the much needed Ancillary Service response and lowering the incentive under DSM Regulation shall not play a role in increase in participation in Ancillary Services, however, this decrease in incentive in draft DSM Regulations 2024, may act as deterrent in their primary response performance.

In view of above backdrop, the Comments of NHPC on draft CERC DSM Regulations 2024 are as under:

**1. Regulation 8(1)(I) of draft CERC DSM Regulations 2024**

Regulation 8(1)(I) specifies the charges for deviation in respect of a general seller other than an RoR generating station or a generating station based on municipal solid waste or WS seller for Deviation upto 10% or 100 MW, whichever is less and  $f$  within  $f_{band}$ . The different scenarios under Regulation 8(1)(I) are as under:

**a) For  $50.00 \text{ Hz} < f \leq 50.05 \text{ Hz}$**

**Deviation by way of over injection (Receivable by the Seller)**

*(ii) When  $[50.00 \text{ Hz} < f \leq 50.05 \text{ Hz}]$ , for every increase in  $f$  by 0.01 Hz, charges for deviation for such seller shall be reduced by 10% of RR so that charges for deviation become 50% of RR when  $f = 50.05 \text{ Hz}$*

**Deviation by way of under injection (Payable by the Seller)**

*(v) When  $[50.00 \text{ Hz} < f \leq 50.05 \text{ Hz}]$ , for every increase in  $f$  by 0.01 Hz, charges for deviation for such seller shall be reduced by 3% of RR so that charges for deviation become 85% of RR when  $f = 50.05 \text{ Hz}$*



**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION  
SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

In the proposed regulation, the charges for deviation payable for under injection when f increases beyond 50.00 Hz shall be reduced by 3% of RR for every increase in frequency by 0.01Hz. Whereas, the receivable by the Seller, shall be reduced by 10% for every increase in frequency by 0.01 Hz.

**Regulation 10(g) of IEGC, 2022** mandates the following:

Quote:

***“(g) All the generating units shall have their governors or frequency controllers in operation all the time with droop settings of 3 to 6 % (for thermal generating units and WS Seller) or 0-10% (for hydro generating units) as specified in the CEA Technical Standards for Connectivity.”***

Further, TABLE 3 of such Regulations, provides the **Primary Response of Various Types of Generating Units**, wherein, it is mandated that **Hydro Plants of capacity 25 MW and above** has to ensure the primary response of **±10% of MCR** whenever changes in frequency takes place.

Unquote

Frequency of the grid varies with respect to the requirement of Load and generating stations have to respond as per their droop setting. The marginal variation of load may be possible considering the droop selling of the generating stations.

Quote:

**(8) Declaration of Declared Capacity by Regional entity generating stations**

(a) The regional entity generating station other than the WS seller shall declare exbus Declared Capacity limited to 100% MCR less auxiliary power consumption, on day ahead basis as per the provisions of Regulation 49 of these regulations:



**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

Provided that the hydro generating stations may declare ex-bus Declared Capacity more than 100% MCR less auxiliary power consumption limited to overload capability in terms of sub-clause (a) of clause (10) of this Regulation during high inflow periods:

Provide further that a high inflow period for this purpose shall be notified by the respective RPC.

Unquote

In compliance of above Regulations, during lean season/less inflow period, RLDC gives schedule up to Ex -bus installed capacity of the generating stations by keeping margin up to 110% of the MCR of the generating stations or unit thereof, for getting primary response, when frequency falls suddenly in the Grid. Therefore, there would be instances when frequency falls suddenly even when frequency > 50.00 Hz and the generating station tends to increase their load depending upon their droop settings, therefore, the reduction in payable to the generating station @10% of RR is not justified.

Rationale of different rates for over injection and under injection provided in "Explanatory Memorandum" is that the generating station should not be overincentivized as to increase participation in Ancillary Services. However, as already explained above, lowering the incentive under DSM Regulation shall not play a role in increase in participation in Ancillary Services, however, it may act as deterrent in their primary response performance.

Therefore, in view of above, it is proposed that the reduction in receivable to the seller may be kept @5% of RR for every increase in  $f$  by 0.01Hz so that the charges for deviation receivable becomes 75% of RR when  $f=50.05$  Hz and the charges for deviation payable by the seller may be reduced @5% of RR for every increase in  $f$  by 0.01Hz so that the charges for deviation payable becomes 75% of RR when  $f=50.05$  Hz. also keeping the similarity in penalty on under injection as well incentive for over injection when  $[50.00 \text{ Hz} < f \leq 50.05 \text{ Hz}]$ .

In view of above, Regulation 8(1)(i)(ii) and 8(1)(i)(v) may be modified as under:



**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

**Deviation by way of over injection (Receivable by the Seller)**

*(ii) When  $[50.00 \text{ Hz} < f \leq 50.05 \text{ Hz}]$ , for every increase in  $f$  by 0.01 Hz, charges for deviation for such seller shall be reduced by 5% of RR so that charges for deviation become 75% of RR when  $f = 50.05 \text{ Hz}$*

**Deviation by way of under injection (Payable by the Seller)**

*(v) When  $[50.00 \text{ Hz} < f \leq 50.05 \text{ Hz}]$ , for every increase in  $f$  by 0.01 Hz, charges for deviation for such seller shall be reduced by 5% of RR so that charges for deviation become 75% of RR when  $f = 50.05 \text{ Hz}$*

**b) For  $49.90 \text{ Hz} \leq f \leq 50.00 \text{ Hz}$**

**Deviation by way of over injection (Receivable by the Seller)**

*(iii) When  $[49.90 \leq f < 50.00 \text{ Hz}]$ , for every decrease in  $f$  by 0.01 Hz, charges for deviation for such seller shall be increased by 1.5% of RR so that charges for deviation become 115% of RR when  $f = 49.90 \text{ Hz}$*

**Deviation by way of under injection (Payable by the Seller)**

*(vi) When  $[49.90 \leq f < 50.00 \text{ Hz}]$ , for every decrease in  $f$  by 0.01 Hz, charges for deviation for such seller shall be increased by 5% of RR so that charges for deviation becomes 150% of RR when  $f = 49.90 \text{ Hz}$*

In the proposed Regulation, the charges for deviation receivable for over injection when  $f$  decreases below 50.00 Hz shall be increased by 1.5% of RR for every decrease in frequency by 0.01 Hz. Whereas, the payable by the Seller, shall be increased by 5% for every decrease in frequency by 0.01 Hz.

In view of NHPC, the incentive being proposed for supporting grid is very minimal and the maximum incentive being provided is 15% of RR. The hydro generating stations have very low ECR i.e. RR. For example in case of Chamara-II, the reference rate (ECR) is Rs 1.2/kWh. Thus,



**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

the incentive being provided to the generator for supporting the grid is 18 paise/kWh only. Hon'ble Commission will also appreciate the fact that such incentive shall not be sufficient to encourage the generator to maximize their support to grid. Further, providing such low incentives shall not play a role in increase in participation in Ancillary Services as already explained above.

Therefore, it is proposed that the charges for deviation receivable for over injection when  $f$  decreases below 50.00 Hz shall be increased by 5% of RR for every decrease in frequency by 0.01Hz to provide sufficient incentive to the generating station to provide grid support and Regulation 8(1)(I)(iii) may be modified as under:

*(iii) When  $[49.90 \leq f < 50.00 \text{ Hz}]$ , for every decrease in  $f$  by 0.01 Hz, charges for deviation for such seller shall be increased by 5% of RR so that charges for deviation become 150% of RR when  $f = 49.90\text{Hz}$*

**2. Regulation 8(1)(II) of draft CERC DSM Regulations 2024**

Regulation 8(1)(II) specifies the charges for deviation in respect of a general seller other than an RoR generating station or a generating station based on municipal solid waste or WS seller for Deviation upto 10% or 100 MW, whichever is less and  $f$  outside  $f_{\text{band}}$ . The different scenarios under Regulation 8(1)(II) are as under:

(ii) @ 115 % of RR when  $[f < 49.90 \text{ Hz}]$

As explained above at point 1(b), the generating station needs to be incentivised enough so that they make maximum effort to support the grid. Therefore, it is proposed that the charges for deviation payable to the seller when  $f < 49.90 \text{ Hz}$  should be the **maximum of the charges of deviation proposed in regulation 8(1)(I)(iii) i.e. 150% of RR as this is a critical zone and the grid should be restored to normal frequency at the earliest.**

**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

(iii) @ 85 % of RR when  $[f > 50.05 \text{ Hz}]$

The charges for deviation for under injection when  $f > 50.05 \text{ Hz}$  should be maximum of charges of deviation as proposed by NHPC in Regulation 8(1)(I)(v) i.e 75% of RR as explained in Point 1(a).

**3. Regulation 8(1)(III) of draft CERC DSM Regulations 2024**

Regulation 8(1)(III) specifies the charges for deviation in respect of a general seller other than an RoR generating station or a generating station based on municipal solid waste or WS seller for Deviation beyond 10% or 100 MW, whichever is  $f$  within and outside  $f_{\text{band}}$

(i) Such seller shall be paid back @ zero when  $(f < 50.10 \text{ Hz})$ :

Provided that such seller shall pay @ 10% of RR when  $[f \geq 50.10 \text{ Hz}]$

In the draft Regulation, it has been proposed that when the deviation is beyond 10% and  $f < 50.10 \text{ Hz}$ , no charges for deviation shall be payable to the seller. This means even if the frequency is less than 50.00 Hz or even below 49.90 Hz, the generating company should not overinject beyond 10% as they will be paid zero for over injection. This will impact the efforts of the seller to restore grid stability as the seller would never inject any energy beyond 10% even if frequency is too low and even if the governor operates under FGMO and inject energy beyond 10% of schedule, the generator will be penalised. NHPC also understands that to maintain grid discipline the sellers should be restrained from deviating beyond volume limit as well.

Therefore, it is proposed that if deviation is beyond 10%, however, the action of the seller is towards restoration of grid, the seller should be paid @RR. This will ensure that the seller is not penalised for supporting grid on one hand and on the other end there will be no incentive for the generator to cross the volume limit if there is no need.

In view of above, Regulation 8(1)(III)(i) may be modified as under

(i) Such seller shall be paid back @ RR when  $(f < 50.00 \text{ Hz})$  and @ zero when  $(50.00 \text{ Hz} \leq f < 50.10 \text{ Hz})$ :



**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

Provided that such seller shall pay @ 10% of RR when [  $f \geq 50.10$  Hz]

**4. Regulation 8(2) of draft CERC DSM Regulations 2024**

Regulation 8(2) specifies the charges for deviation in respect of a general seller being an RoR generating station, shall be without any linkage to grid frequency. Under scenario (ii) of the draft Regulation, following has been proposed

**Deviation by way of over injection (Receivable by the Seller)**

(ii) @ Zero for deviation beyond [10% DGS or 100 MW, whichever is less]

The proposed regulation provides that receivable to the seller for deviation beyond 10% in case of over injection by RoR Hydro Power plants shall be zero. In this regard, following is submitted:

Run of River power stations on one hand does not have enough pondage to accommodate the excess inflow over and above schedule energy and on the other hand release of water through radial gates is not advisable due to protocol and administrative issues. Therefore, RoR Power Station is left only with option to over inject, if there is excess inflow than anticipated.

The same is explained as under: Uri (4X120MW) is purely Run of River power station being operated in UT of J&K by NHPC and scheduling of this power station is being done by NRLDC as per prevailing regulation of IEGC/DSM/Tariff Regulations. Lower Jhelum Hydro Power Station, LJHP is a 105 MW Hydro Power house of (J&K) in the upstream of Uri Power Station, which operates under the control of UT of J&K and scheduling of this power station is being done by SLDC based on local demand requirements. The power station of LJHP is 1.5 Km upstream of Uri Intake barrage whereas the diversion barrage of LJHP is 10.2 Km upstream of Uri intake barrage.

It is to mention here that Uri Power Station 480(4X120) MW and Lower Jhelum Hydroelectric Power (LJHP) Station 105(3X35) MW are cascade Hydroelectric Power Projects in the District of Baramulla, J&K. Water inflow to Uri Power Station is regulated



**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

mostly during lean season by LJHP being in upstream of the same. Under injection occurs when Uri Power station is unable to utilize its generating capacity due to insufficient water inflow. This can happen when upstream Lower Jhelum hydro project, which is owned by UT utility, does not release adequate water. Conversely, over injection arises when excessive water is released from the upstream project, leading to a surplus of water at the downstream power station.

**On September 1st, 2023**, during Blocks 16, 17, and 18, there was a sudden surge in inflow due to increased load at LJHP. Consequently, over injection was performed to manage the excess water flow.

**On September 4th, 2023**, during Blocks 69, 70, 71, and 72, sudden rise in inflow occurred due to increased load at LJHP, resulting in over injection. Additionally, despite receiving information from LJHP regarding the MW they intended to run, there was no decrease in load as anticipated. Consequently, the actual inflow did not decrease as estimated, compelling us to resort to over injection.

**On January 1st, 2024**, During Blocks 1, 2, 3, 4, and 6, Uri Power Station scheduled its operations based on verbal information received from the Lower Jhelum Hydroelectric Project (LJHP). However, LJHP did not decrease its load as anticipated consequently; the actual inflow did not decrease, leading to a situation where Uri Power Station had to resort to over injection.

**On February 29, 2024**, It was stated that, LHJP informed that they will clean trash around 09:00 AM on 29/02/2024, (at the time of trash cleaning at LJHP intake barrage, the trash is diverted into the river by closing/reduction in generation of the machines, opening the spillway gates at LJHP intake barrage manually and by depleting the reservoir. During this process, Uri intake barrage receives inflow after 45-60 minutes.) Accordingly water was expected in Uri Power Station by 10:00 am so Uri Power station punched a schedule of 380 MW in block number 41 and 42 (from 10:00 pm to 10:30 am). However, an increase in water level of Uri intake barrage was seen around 09:30 AM which was not as per



**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

anticipation. Therefore in block no 39 and 40 (09:30 to 09:45 Hrs.) Uri Power Station had to resort to over injection.

**(The details of over injection is attached as per Annexure-I)**

Further, it is also pertinent to mention here that in case of sudden increase of inflow at Uri Power Station, the release of water through radial gate cannot be done being administrative issue. Since as per protocol for release of water from barrage, we have to make public announcement to the downstream habitants for their safety. Hence, Uri Power Station left the option to make over-injection, which may go beyond 10% even more than 100MW.

The proposed regulation underscores the interdependency between two cascading hydro power stations owned by different utilities and connected to different grids. The upstream station controls water flow to the downstream project, particularly during low-water periods. When there is a sudden increase in load at the upstream station, there is a corresponding surge in water levels downstream, allowing inadequate time for schedule adjustments. Consequently, this scenario frequently leads to generation exceeding the declared schedule. In consideration of these factors, it is requested that the overinjection limit of RoR power station may be enhanced to at least 25% and the generator shall be payable @RR upto 25% or 200MW whichever is less as over injection in such condition is beyond the control of the seller.

In view of above, Regulation 8(2)(i) and Regulation 8(2)(ii) may be modified as under:

- (i) @ RR for deviation up to [25% DGS or 200 MW, whichever is less];
- (ii) @ Zero for deviation beyond [20% DGS or 200 MW, whichever is less]

Further, under scenario (iii), (iv) and (v) of the draft Regulation, following has been proposed

**Deviation by way of under injection (Payable by the Seller)**

- (iii) @ RR for deviation up to [10% DGS or 100 MW, whichever is less];



**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

- (iv) @ 105% of RR for deviation beyond [10% DGS or 100 MW, whichever is less] and up to [15% DGS or 150 MW, whichever is less];
- (v) @ 110% of RR for deviation beyond [15% DGS or 150 MW, whichever is less].

As explained above, the operation of ROR plants in Cascade Mode depends on the operation of upstream plants. The scenarios where ROR power plants have to overinject due to sudden release of water from upstream projects have been explained above, however, there have been scenarios when the upstream power station has regulated water flow to the downstream project, especially during periods of low water/lean season or during emergencies such as shutdowns or equipment failures at the upstream station, there is a sudden decrease in water levels downstream, leaving insufficient time for schedule adjustments. This situation often incurs significant negative DSM penalties imposed by regulatory bodies. In light of this, it is proposed to decrease or eliminate penalties or the % of deviation limit may be increased for such deviations in case of under injection, as inflow of water is beyond the control of Run of River generating station.

In view of above, following modifications have been proposed in Regulation 8(2)(iii), Regulation 8(2)(iv) and Regulation 8(2)(v)

Deviation by way of under injection (Payable by the Seller)

- (ii) @ RR for deviation up to [20% DGS or 150 MW, whichever is less];
- (iii) @ 105% of RR for deviation beyond [20% DGS or 150 MW, whichever is less] and up to [30% DGS or 150 MW, whichever is less];
- (iv) @ 110% of RR for deviation beyond [30% DGS or 150 MW, whichever is less].

**Additional Comment**

In the draft, no regulation has been proposed for overinjection against zero scheduled during start up, restoration of machines and shut down of machine. In this regard, it is submitted that while synchronizing of Unit (s), generators normally synchronize their unit (s) just ahead of scheduled time block during ramping Up to meet the injection schedule



**COMMENTS ON DRAFT CENTRAL ELECTRICITY REGULATORY COMMISSION (DEVIATION  
SETTLEMENT MECHANISM AND RELATED MATTERS) REGULATIONS, 2024**

of particular time block. Similar phenomenon occurred during de-synchronisation of machine or ramp down of the Unit(s). In such case the over injection and under injection of more than 10% shall be considered and there would be penalty to inject power in a time block against zero schedule. Therefore, in each case there may be challenges to generator to adhere the schedule. Therefore, it is requested that some provision may be proposed in such situation in CERC DSM Regulations 2024.



## Annexure-A

Date	TIME Block	INFLOW	RLDC/SLDC SCHEDULE (MWh)	ACTUAL (MWh)	DEVIATION (MWh)	% DEVIATION
01.09.2023	13	161.73	55	56.62	2	3
	14	161.73	55	57.59	3	5
	15	161.73	55	59.73	5	9
	16	161.73	55	72.21	17	31
	17	221.43	55	72.46	17	32
	18	221.43	55	72.7	18	32
	19	221.43	107.5	104.67	-3	-3
	20	221.43	107.5	105.73	-2	-2
	21	132.62	55	68.96	14	25
04.09.2023	65	88.21	35	37.13	2	6
	66	88.21	35	35.67	1	2
	67	88.21	35	36.64	2	5
	68	88.21	35	38.12	3	9
	69	105.48	25	38.23	13	53
	70	105.48	25	38.34	13	53
	71	105.48	25	39.1	14	56
	72	105.48	25	46.48	21	86
	73	101.04	110	104.06	-6	-5
	74	101.04	110	105.73	-4	-4
	75	101.04	42.5	53.62	11	26
76	101.04	42.5	43.84	1	3	
01.01.2024	93	19.13	2.5	2.716	0.22	9
	94	19.13	2.5	2.722	0.22	9
	95	19.13	10	10.069	0.07	1
	96	19.13	10	10.325	0.32	3
	1	53.67	2.5	3.29	1	32
	2	53.67	2.5	8.62	6	245
	3	53.67	2.5	15.07	13	503
	4	53.67	2.5	27.14	25	986
	5	181.96	2.5	19.73	17	689
	6	181.96	2.5	27.73	25	1009
7	181.96	80	84.57	5	6	
8	181.96	80	86.06	6	8	
29.02.2024	35	139.03	57.5	67.12	10	17
	36	139.03	57.5	64.31	7	12
	37	189.36	57.5	63.61	6	11
	38	189.36	57.5	65.13	8	13
	39	189.36	57.5	79.33	22	38
	40	189.36	57.5	79.63	22	38
	41	191.83	95	89.11	-6	-6
	42	191.83	95	89.47	-6	-6
	43	191.83	62.5	65.62	3	5
	44	191.83	62.5	64.42	2	3
	45	165.18	95	86.69	-8	-9
	46	165.18	95	90.86	-4	-4