25 **Attachment J – Determination of Day-Ahead Margin Assurance Payments and Import Curtailment Guarantee Payments**

25.1 ~~General Rule~~Introduction

If a~~n eligible~~ Supplier that is eligible pursuant to Section 25.2 of this Attachment J buys out of a Day-Ahead Energy, Regulation Service or Operating Reserve schedule in a manner that reduces its Day-Ahead Margin it shall receive a Day-Ahead Margin Assurance Payment, except as noted in Sections 25.4, and 25.5 of this Attachment J. The purpose of such payments is to protect Suppliers' Day-Ahead Margins associated with real-time reductions after accounting for: (iI) any real-time profits associated with offsetting increases in real-time Energy, Regulation Service, or Operating Reserve sSchedules; and (ii) any Supplier-requested real-time de-rate granted by the ISO. ~~Day-Ahead Margin Assurance Payments payable to Limited Energy Storage Resources~~

	Formatted: Font: Not Italic
	Formatted: Font: Not Italic

In addition, a Supplier may be eligible to receive an Import Curtailment Guarantee Payment if its Import is curtailed at the request of the ISO as ~~shall be~~ determined pursuant to Section 25.6 of this Attachment J.

25.2   Eligibility for Receiving Day-Ahead Margin Assurance Payments

25.2.1   General Eligibility Requirements for Suppliers to Receive Day-Ahead Margin Assurance Payments

Subject to Section 25.2.2 of this Attachment J, ~~T~~the following categories of Resources bid by Suppliers shall be eligible to receive Day-Ahead Margin Assurance Payments:~~ provided however, that intermittent Power Resources depending on wind as their fuel shall not be eligible for Day-Ahead Margin Assurance Payments~~ (~~i~~l) all Self-Committed Flexible and ISO-Committed Flexible Generators that are online and dispatched by RTD; (ii) Demand Side Resources committed to provide Operating Reserves or Regulation Service; (iii) any ~~Supplier~~Resource that is scheduled out of economic merit order by the ISO in response to an ISO or Transmission Owner system security need or to permit the ISO to procure additional Operating Reserves; (iv) any ~~Supplier~~Resource internal to the NYCA that is derated or decommitted by the ISO in response to an ISO or Transmission Owner system security need or to permit the ISO to procure additional Operating Reserves; and (v) Energy Limited Resources with~~ a total margin for the dispatch day that is less than its Day-Ahead margin as a result of~~ an ISO-approved real-time reduction in scheduled output from its Day-Ahead schedule~~ for Energy limited reasons~~.

25.2.2   Exceptions

Notwithstanding Section 25.2.1 of this Attachment J, ~~N~~no Day-Ahead Margin Assurance Payment shall be paid to:

25.2.2.1   a ~~Generator,~~ Resource otherwise eligible for a Day-Ahead Margin Assurance Payment~~,~~ in hours in which the NYISO has increased the ~~Generator's,~~ Resource's minimum operating level~~,~~ either: (i) at the ~~Generator's~~ Resource's request; or (ii) in order to reconcile the ISO's dispatch with the ~~Generator's~~Resource's actual output or to

address reliability concerns that arise because the ~~Generator,~~Resource is not following Base Point Signals; or (iii) an Intermittent Power Resource that depends on wind as its fuel.

25.2.2.2   a Generator, otherwise eligible for Day-Ahead Margin Assurance Payments, for (i) any hour in which the Incremental Energy Bids submitted in the real-time market for that Generator exceed the Incremental Energy Bids submitted in the Day-Ahead Market, or the mitigated Day-Ahead Incremental Energy Bids where appropriate, for the portion of that Generator's Capacity that was scheduled in the Day-Ahead Market; and (ii) the two hours immediately preceding and the two hours immediately following the hour(s) in which the Incremental Energy Bids submitted in the real-time market for that Generator exceed the Incremental Energy Bids submitted in the Day-Ahead Market, or the mitigated Day-Ahead Incremental Energy Bids where appropriate, for the portion of that Generator's Capacity that was scheduled in the Day-Ahead Market.

25.3   Calculation of Day-Ahead Margin Assurance Payments

25.3.1   Formula for Day-Ahead Margin Assurance Payments for Generators, Except for Limited Energy Storage Resources

Subject to Sections 25.4 and 25.5 of this Attachment J, Day-Ahead Margin Assurance Payments

for Generators, except for Limited Energy Storage Resources, shall be determined by applying the

following equations to each individual Generator using the terms as defined in ~~subs~~Section 25.3.~~3~~4:

$$\cancel{DMAP_{hu} = \max\left(0, \sum_{i\in h} CDMAP_{iu}\right) \text{ where:}}$$

$$\cancel{CDMAP_{iu} = CDMAPen_{iu} + \sum_{p} CDMAPres_{iup} + CDMAPreg_{iu}}$$

$$DMAP_{hu} = \max\left(0, \sum_{i \in h} CDMAP_{iu}\right) \quad \text{where:}$$

$$CDMAP_{iu} = CDMAPen_{iu} + \sum_{P} CDMA\mathrm{Pr}\,es_{iup} + CDMA\mathrm{Pr}\,eg_{iu}$$

If the ~~Supplier's~~Generator's real-time Energy schedule is lower than its Day-Ahead Energy

schedule then:

$$CDMAPen_{iu} = \left\{ \begin{array}{c} \left[DASen_{hu} - LL_{iu}\right] \times RTPen_{iu} \\ - \int_{LL_{iu}}^{DASen_{hu}} DABen_{hu} \end{array} \right\} * \frac{Seconds_i}{3600},$$

If the ~~Supplier's~~Generator's real-time Energy schedule is greater than or equal to its Day-Ahead

Energy schedule then:

$$CDMAPen_{iu} = MIN\left(\left\{ \begin{array}{c} \left[DASen_{hu} - UL_{iu}\right) \times RTPen_{iu} \\ + \int_{DASen_{hu}}^{UL_{iu}} RTBen_{iu} \end{array} \right\} * \frac{Seconds_i}{3600}, 0 \right)$$

If the ~~Supplier's~~Generator's real-time schedule for a given Operating Reserve product, p, is

lower than its Day-Ahead Operating Reserve schedule for that product then:

$$CDMAPres_{iup} = \left[\left(DASres_{hup} - RTSres_{iup}\right) \times \left(RTPres_{iup} - DABres_{hup}\right)\right] * \frac{Seconds_i}{3600}$$

If the ~~Supplier's~~Generator's real-time schedule for a given Operating Reserve product, p, is

greater than or equal to its Day-Ahead Operating Reserve schedule for that product then:

$$CDMAPres_{iup} = \left[\left(DASres_{hup} - RTSres_{iup}\right) \times \left(RTPres_{iup}\right)\right] * \frac{Seconds_i}{3600}$$

If the ~~Supplier's~~Generator's real-time Regulation Service schedule is less than its Day-Ahead

Regulation Service schedule then:

$$CDMAPreg_{iu} = \left[\left(DASreg_{hu} - RTSreg_{iu}\right) \times \left(RTPreg_{iu} - DABreg_{hu}\right)\right] * \frac{Seconds_i}{3600}$$

If the ~~Supplier's~~Generator's real-time Regulation Schedule is greater than or equal to the Day-

Ahead Regulation Service schedule then:

$$CDMAPreg_{iu} = \left[\left(DASreg_{hu} - RTSreg_{iu}\right) \times MAX\left(\left(RTPreg_{iu} - RTBreg_{iu}\right),0\right)\right] * \frac{Seconds_i}{3600} .$$

25.3.2   Formula for Day-Ahead Margin Assurance Payments for Demand Side Resources

25.3.2.1   Formula for Day-Ahead Margin Assurance Payment for Demand Side Resources

Subject to Section 25.5 of this Attachment J, Day-Ahead Margin Assurance Payments for

Demand Side resources scheduled to provide Operating Reserves or Regulation Service shall be

determined by applying the following equations to each individual Demand Side Resource using the

terms as defined in ~~sub~~Section 25.3.~~3~~4, except for RPIiu, which is defined in Section 25.3.2.2:

$$DMAP_{hu} = \max\left(0, \sum_{i \in h} CDMAP_{iu}\right) \text{where:}$$

$$CDMAP_{iu} = \sum_{p} CDMAPres_{iup} + CDMAPreg_{iu},$$

If the Demand Side Resource's real-time schedule for a given Operating Reserve product, p, is lower than its Day-Ahead Operating Reserve schedule for that product then:

$$CDMAPres_{iup} = \left[\left(DASres_{hup} - RTSres_{iup}\right) \times \left(RTPres_{iup} - DABres_{hup}\right)\right] * RPIiu * \frac{Seconds_i}{3600}$$

If the Demand Side Resource's real-time schedule for a given Operating Reserve product, p, is greater than or equal to its Day-Ahead Operating Reserve schedule for that product then:

$$CDMAPres_{iup} = \left[\left(DASres_{hup} - RTSres_{iup}\right) \times \left(RTPres_{iup}\right)\right] * RPIiu * \frac{Seconds_i}{3600}$$

If the Demand Side Resource's real-time Regulation Service schedule is less than its Day-Ahead Regulation Service schedule then:

$$CDMAPreg_{iu} = \left[\left(DASreg_{hu} - RTSreg_{iu}\right) \times \left(RTPreg_{iu} - DABreg_{hu}\right)\right] * \frac{Seconds_i}{3600}$$

If the Demand Side Resource's real-time Regulation Schedule is greater than or equal to the Day-Ahead Regulation Service schedule then:

$$CDMAPreg_{iu} = \left[\left(DASreg_{hu} - RTSreg_{iu}\right) \times MAX\left(\left(RTPreg_{iu} - RTBreg_{iu}\right), 0\right)\right] * \frac{Seconds_i}{3600}.$$

25.3.2.2   Reserve Performance Index for Demand Side Resource Suppliers of Operating Reserves

The ISO shall produce a Reserve Performance Index for purposes of calculating a Day Ahead Margin Assurance Payment for a Demand Side Resource providing Operating Reserves. The Reserve

Performance Index shall take account of the actual Demand Reduction achieved by the Supplier of Operating Reserves following the ISO's instruction to convert Operating Reserves to Demand Reduction.

The Reserve Performance Index shall be a factor with a value between 0.0 and 1.0 inclusive. For each interval in which the ISO has not instructed the Demand Side Resource to convert its Operating Reserves to Demand Reduction, the Reserve Performance Index shall have a value of one. For each interval in which the ISO has instructed the Demand Side Resource to convert its Operating Reserves to Demand Reduction the Reserve Performance Index shall be calculated pursuant to the following formula, provided however when UAGi is zero or less, the Reserve Performance Index shall be set to zero:

$$RPI_{iu} = Min \left[(UAGi / ADGi + .1), 1 \right]$$

Where:

RPI$_{iu}$ =   Reserve Performance Index in interval i for Demand Side Resource u;

UAGi   =   average actual Demand Reduction for interval i, represented as a positive generation value; and

ADGi   =   average scheduled Demand Reduction for interval i, represented as a positive generation base point.

25.3.3   Formula for Day-Ahead Margin Assurance Payments for Limited Energy Storage Resources

Day-Ahead Margin Assurance Payments for Limited Energy Storage Resources scheduled to provide Regulation Service shall be determined by applying the following equations to each Resource using the terms as defined in Section 25.3.4; *provided, however*, that a Day-Ahead Margin Assurance Payment is payable only for intervals in which the NYISO has reduced the real-time Regulation Service offer (in MWs) of a Limited Energy Storage Resource and the NYISO is not pursuing LESR Energy Management for such Resource for such interval, pursuant to ISO Procedures:

If the LESR's real-time Regulation Service schedule is less than its Day-Ahead Regulation Service schedule then:

$$CDMAPreg_{iu} = \left[\left(DASreg_{hu} - RTSreg_{iu} \right) * \left(RTPreg_{iu} - DABreg_{hu} \right) \right] * K_{n} * \frac{Seconds_i}{3600}$$

If the LESR's real-time Regulation Service schedule is greater than or equal to the Day-Ahead Regulation Service schedule then:

$$CDMAPreg_{iu} = \left[(DASreg_{hu} - RTSreg_{iu}) \times MAX\left((RTPreg_{iu} - RTBreg_{iu}), 0 \right) \right] * \frac{Seconds_i}{3600}$$

25.3. 34   Terms Used in this Attachment J

The terms used in the formulas in this Attachment J shall be defined as follows:

h is the hour that includes interval *i*;

DMAPhu   =   the Day-Ahead Margin Assurance Payment attributable in any hour h to any Supplier u;

$CDMAP_{iu}$ =   the contribution of RTD interval *i* to the Day-Ahead Margin Assurance Payment for Supplier *u*;

$CDMAPen_{iu}$ = the Energy contribution of RTD interval i to the Day-Ahead Margin Assurance Payment for Supplier u;

$CDMAPreg_{iu}$ = the Regulation Service contribution of RTD interval i to the Day-Ahead Margin Assurance Payment for Supplier u;

$CDMAPres_{iup}$ = the Operating Reserve contribution of RTD interval i to the Day-Ahead Margin Assurance Payment for Supplier u determined separately for each Operating Reserve product p;

$DASen_{hu}$ = Day-Ahead Energy schedule for Supplier u in hour h;

$DASreg_{hu}$ = Day-Ahead schedule for Regulation Service for Supplier u in hour h;

$DASres_{hup}$ = Day-Ahead schedule for Operating Reserve product p, for Supplier u in hour h;

$DABen_{hu}$ = Day-Ahead Energy bid curve for Supplier u in hour h;

$DABreg_{hu}$ = Day-Ahead Availability Bid for Regulation Service for Supplier u in hour h;

$DABres_{hup}$ = Day-Ahead Availability Bid for Operating Reserve product p for Supplier u in hour h;

$RTSen_{iu}$ = rReal-time Energy scheduled for Supplier u in interval i, and calculated as the arithmetic average of the 6-second AGC Base Point Signals sent to Supplier u during the course of interval i;

$RTSreg_{iu}$ = rReal-time schedule for Regulation Service for Supplier u in interval i.

$RTSres_{iup}$ = rReal-time schedule for Operating Reserve product p for Supplier u in interval i.

$RTBreg_{iu}$ = rReal-time Availability Bid for Regulation Service for Supplier u in interval i.

$RTBen_{iu}$ = rReal-time Energy bid curve for Supplier u in interval i.

AEI_{iu} = average Actual Energy Injection by Supplier u in interval i but not more than $RTSen_{iu}$ plus Compensable Overgeneration;

$RTPen_{iu}$ = real-time price of Energy at the location of Supplier u in interval i;

$RTPreg_{iu}$ = real-time price of Regulation Service at the location of Supplier u in interval i;

$RTPres_{iup}$ = real-time price of Operating Reserve product p at the location of Supplier u in interval i;

LL_{iu} = ~~max ($RTSen_{iu}$, min(AEI_{iu},EOP_{iu})), but not more than $DASen_{iu}$ if $RTSen_{iu}$ < EOP_{iu} and min ($RTSen_{iu}$, max(AEI_{iu},EOP_{iu})), but not more than $DASen_{hu}$ otherwise;~~either, as the case may be:

(a) if $RTSen_{iu}$ < EOP_{iu}, then LL_{iu} = min(max ($RTSen_{iu}$, min(AEI_{iu},EOP_{iu})), $DASen_{hu}$); or

(b) if $RTSen_{iu} \geq EOP_{iu}$, then LL_{iu} = min ($RTSen_{iu}$, max(AEI_{iu},EOP_{iu}), $DASen_{hu}$),

UL_{iu} = ~~min ($RTSen_{iu}$, max(AEI_{iu},EOP_{iu})) but not less than $DASen_{hu}$ if $RTSen_{iu} \geq EOP_{iu} \geq DASen_{hu}$ and max ($RTSen_{iu}$, min(AEI_{iu},EOP_{iu})) but not less than $DASen_{iu}$ otherwise;~~either, as the case may be:

(a) if $RTSen_{iu} \geq EOP_{iu} \geq DASen_{hu}$, then UL_{iu} = max (min ($RTSen_{iu}$, max(AEI_{iu},EOP_{iu})), $DASen_{hu}$); or

(b) otherwise, then UL_{iu} = max ($RTSen_{iu}$, min(AEI_{iu},EOP_{iu}), $DASen_{hu}$);

EOP_{iu} = the Economic Operating Point of Supplier u in interval i calculated without regard to ramp rates;

$Seconds_i$ = number of seconds in interval i

~~RPI_{iu} = the Reserves Performance Index in interval i for Demand Side Resource u. The Reserves Performance Index is calculated pursuant to Section 15.4.3.6 of Rate Schedule 4 of this Services Tariff.~~

K_{PI} = the factor derived from the Regulation Service Performance index for Resource u for interval i as defined in Rate Schedule 3 of this Services Tariff which shall initially be set at 1.0 for LESRs.

~~**25.3.4 Other Provisions**~~

~~The AGC Base Point Signal for a Supplier that is not providing Regulation Service during a given RTD interval shall be initialized by either: (i) the Supplier's last AGC Base Point Signal from the prior RTD~~

interval; or (ii) the Supplier's actual metered generation or calculated Demand Reduction at the time

new RTD Base Point Signals are received by the ISO's AGC software, whichever is closer to the Supplier's

new RTD Base Point Signal. AGC Base Point Signals for a Supplier that is not providing Regulation Service

will ramp evenly over the course of the RTD interval starting at the initialized AGC Base Point Signal and

ending at the level of its new RTD Base Point Signal. AGC Base Point Signals for Suppliers providing

Regulation Service during a given RTD interval are determined based on the ISO's need to minimize the

NYCA area control error.

25.4   Exception for Generators Lagging Behind RTD Base Point Signals

~~An otherwise eligible Generator that does not respond to, or that lags behind, the ISO's RTD Base Point Signals in a given interval, as determined below, shall not be eligible for Day-Ahead Margin Assurance Payments for that interval.~~ If <u>an otherwise eligible</u> ~~such a~~ Generator's average Actual Energy Injection in an RTD interval (*i.e.*, its Actual Energy Injections averaged over the RTD interval) is less than or equal to its penalty limit for under-generation value for that interval, as computed below, it shall not be eligible for Day-Ahead Margin Assurance Payments for that interval.

The penalty limit for under-generation value is the tolerance described in Section 15.3A.1 of Rate Schedule 3-A of this ISO Services Tariff, which is used in the calculation of the persistent under-generation charge applicable to Generators that are not providing Regulation Service.

25.5 Rules Applicable to Supplier Derates

Suppliers that request and are granted a derate of their real-time Operating Capacity, but that are otherwise eligible to receive Day-Ahead Margin Assurance Payments may receive a payment up to a Capacity level consistent with their revised Emergency Upper Operating Limit or Normal Upper Operating Limit, whichever is applicable. The foregoing rule shall also apply to a Generator, otherwise eligible for a Day-Ahead Margin Assurance Payment, in hours in which the ISO has derated the Generator's Operating Capacity in order to reconcile the ISO's dispatch with the Generator's actual output, or to address reliability concerns that arise because the Generator is not following Base Point Signals. If a Supplier's derated real-time Operating Capacity is lower than the sum of its Day-Ahead Energy Regulation Services and Operating Reserve schedules then when the ISO conducts the calculations described in Section 25.3 above, the DASen, DASeg and DASres$_p$ variables will be reduced by REDen, REDreg and REDres$_p$ respectively. REDen, REDreg and REDres$_p$ shall be calculated using the formulas below:

$$REDtot_{iu} = max(DASen_{hu} + DASreg_{hu} + \Sigma_p DASres_{hup} - RTUOL_{iu}, 0)$$

$$POTREDen_{iu} = max(DASen_{hu} - RTSen_{iu}, 0)$$

$$POTREDreg_{iu} = max(DASreg_{hu} - RTSreg_{iu}, 0)$$

$$POTREDres_{iup} = max(DASres_{hup} - RTSres_{iup}, 0)$$

$$REDen_{iu} = ((POTREDen_{iu}/(POTREDen_{iu} + POTREDreg_{iu} + \Sigma_p POTREDres_{iup})) * REDtot_{iu}$$

$$REDreg_{iu} = ((POTREDreg_{iu}/(POTREDen_{iu} + POTREDreg_{iu} + \Sigma_p POTREDres_{iup})) * REDtot_{iu}$$

$$REDres_{iup} = ((POTREDres_{iup}/(POTREDen_{iu} + POTREDreg_{iu} + \Sigma_p POTREDres_{iup})) * REDtot_{iu}$$

where:

$RTUOL_{iu}$ = The real-time Emergency Upper Operating Limit or Normal Upper Operating Limit whichever is applicable of Supplier u in interval i

REDtot$_{iu}$ = The total amount in MW that Day-Ahead schedules need to be reduced to account for the derate of Supplier u in interval i;

REDen$_{iu}$ = The amount in MW that the Day-Ahead Energy schedule is reduced for the purposes of calculating the Day-Ahead Margin Assurance Payment for Supplier u in interval i;

REDreg$_{iu}$ = The amount in MW that Supplier u's Day-Ahead Regulation Service schedule is reduced for the purposes of calculating the Day-Ahead Margin Assurance Payment in interval i;

REDres$_{iup}$ = The amount in MW that Supplier u's Day-Ahead Operating Reserve schedule for Operating Reserves product p is reduced for the purposes of calculating the Day-Ahead Margin Assurance Payment in interval i;

POTREDen$_{iu}$ = The potential amount in MW that Supplier u's Day-Ahead Energy schedule could be reduced for the purposes of calculating the Day-Ahead Margin Assurance Payment for Supplier u in interval i;

POTREDreg$_{iu}$ = The potential amount in MW that Supplier u's Day-Ahead Regulation Service ~~S~~schedule could be reduced for the purposes of calculating the Day-Ahead Margin Assurance Payment for Supplier u in interval i;

POTREDres$_{iup}$ = The potential amount in MW that Supplier u's Day-Ahead Operating Reserve Schedule for Operating Reserve product p could be reduced for the purposes of calculating the Day-Ahead Margin Assurance Payment for Supplier in interval;

All other variables are as defined above.

25.6   Import Curtailment Guarantee Payments

25.6.1   Eligibility for an Import Curtailment Guarantee Payment for an Import Curtailed by the ISO

In the event that the Energy injections scheduled by RTC_{15} at a Proxy Generator Bus are Curtailed at the request of the ISO, then the Supplier or Transmission Customer that is subjected to the Curtailment, in addition to the charge for Energy Imbalance, shall be eligible for an Import Curtailment Guarantee Payment as determined in Section 25.6.2 of this Attachment J.

25.6.2   Formula for an Import Curtailment Guarantee Payment for a Supplier Whose Import Was Curtailed by the ISO

A Supplier eligible under Section 25.6.1 of this Attachment J shall receive an Import Curtailment Guarantee Payment for its curtailed Energy injections that is equal to the sum for each hour of the interval payments determined in the formula below.

Import Curtailment Guarantee Payment to Supplier u in association with Import t=

$$\max\left[\left(RTLBMP_{ti} - \max\left(DecBid_{ti},0\right)\right)\cdot\left(RTCen_{ti} - RTDen_{ti}\right)\cdot\frac{S_i}{3600}, 0\right].$$

Where

i   =   the relevant interval;

S_i =   number of seconds in interval i;

$RTLBMP_{t,i}$ =   the real-time LBMP, in $/MWh, for interval i at the Proxy Generator Bus which is the source of the Import t.

$DecBid_{t,i}$ =   the Decremental Bid, in $/MWh, for Import t in hour h containing interval i;

$RTCen_{t,i}$ =   the scheduled Energy injections, in MWh, for Import t in hour h containing interval i as determined by Real-Time Commitment (RTC_{15}); and

$RTDen_{t,i}$ =   the scheduled Energy injections, in MWh, for Import t in interval i as determined by Real-Time Dispatch (RTD).

Day-Ahead Margin Assurance Payments for Limited Energy Storage Resources

A.   Day-Ahead Margin Assurance Payments for Limited Energy Storage Resources scheduled to provide Regulation Service shall be determined by applying the following equations to each Resource using the terms as defined in subsection 25.3.3, provided however, DAMAP is payable only for intervals in which the NYISO has reduced the real-time Regulation Service offer (in MWs) of a Limited Energy Storage Resource to account for the Energy storage capacity of such Resource and the NYISO is not pursuing LESR Energy Management for such Resource for such interval, pursuant to ISO Procedures:

If the Supplier's real-time Regulation Service schedule is less than its Day-Ahead Regulation Service schedule then:

$$CDMAPreg_{i} = \left[\left(DASreg_{h} - RTSreg_{i} \right) * \left(RTPreg_{i} - DABreg_{h} \right) \right] * K_{n} * \frac{Seconds_{i}}{3600}$$

If the Supplier's real-time Regulation Service schedule is greater than or equal to the Day-Ahead

Regulation Service schedule then:

$$CDMAPreg_{iu} = [(DASreg_{hu} - RTSreg_{iu}) \times MAX((RTPreg_{iu} - RTBreg_{iu}), 0)] * \frac{Seconds}{3600}$$