



# GACETA OFICIAL

DIGITAL

Año CXV

Panamá, R. de Panamá jueves 22 de septiembre de 2016

N° 28123-B

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## CONTENIDO

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### AUTORIDAD NACIONAL DE LOS SERVICIOS PÚBLICOS

Resolución AN N° 10377 -Elec  
(De lunes 29 de agosto de 2016)

POR LA CUAL SE APRUEBA LA CELEBRACIÓN DE LA CONSULTA PÚBLICA NO. 007-16-ELEC, PARA CONSIDERAR LA PROPUESTA DEL PLAN DE EXPANSIÓN DEL SISTEMA INTERCONECTADO NACIONAL CORRESPONDIENTE AL AÑO 2016, PRESENTADA POR LA EMPRESA DE TRANSMISIÓN ELÉCTRICA, S.A. (ETESA).

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*República de Panamá*  
AUTORIDAD NACIONAL DE LOS SERVICIOS PÚBLICOS



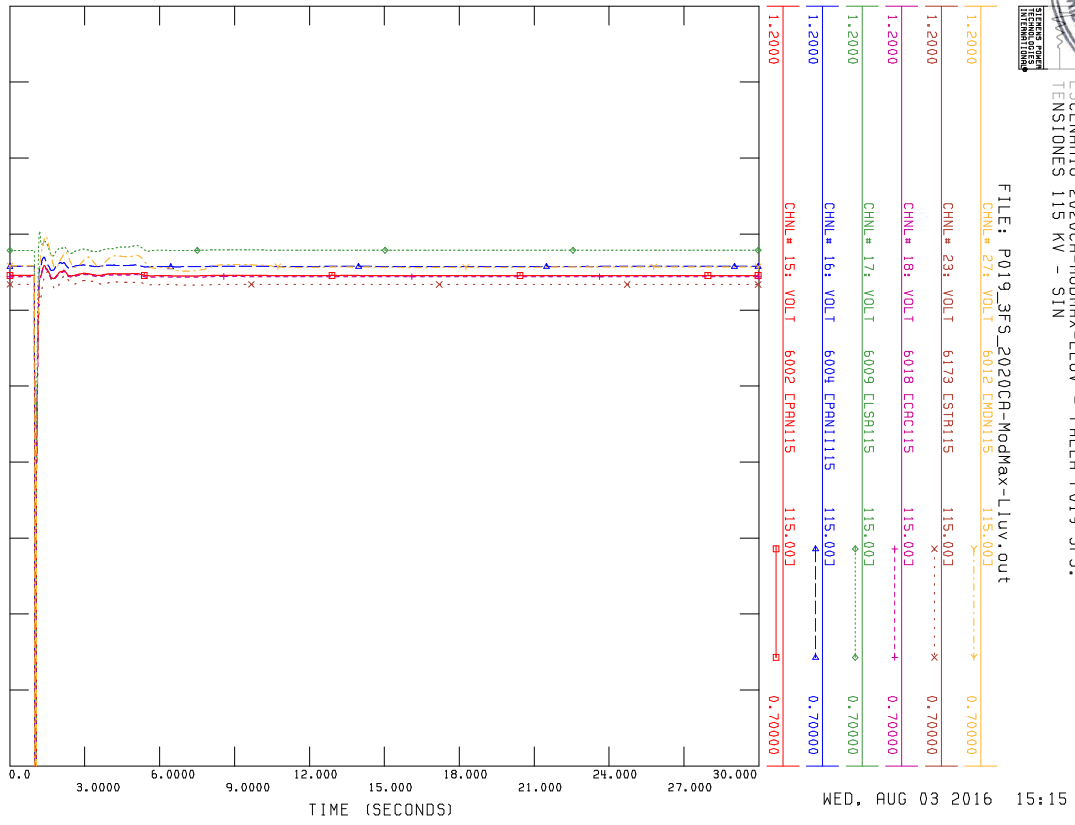
Resolución AN No. 10377 -Elec

Panamá, 29 de agosto de 2016

“Por la cual se aprueba la celebración de la Consulta Pública No. 007-16-Elec, para considerar la propuesta del Plan de Expansión del Sistema Interconectado Nacional correspondiente al año 2016, presentada por la Empresa de Transmisión Eléctrica, S.A. (ETESA).”

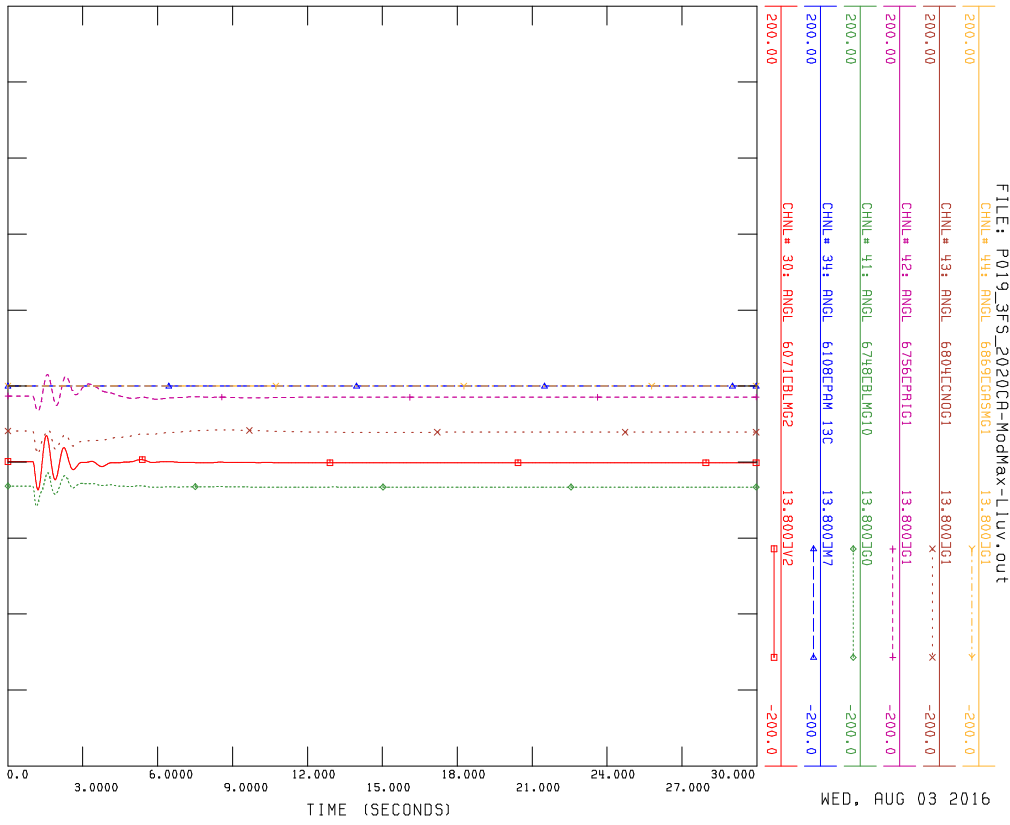
**ANEXO A**

**TOMO VIII (De la foja 1401 a la foja 1600)**





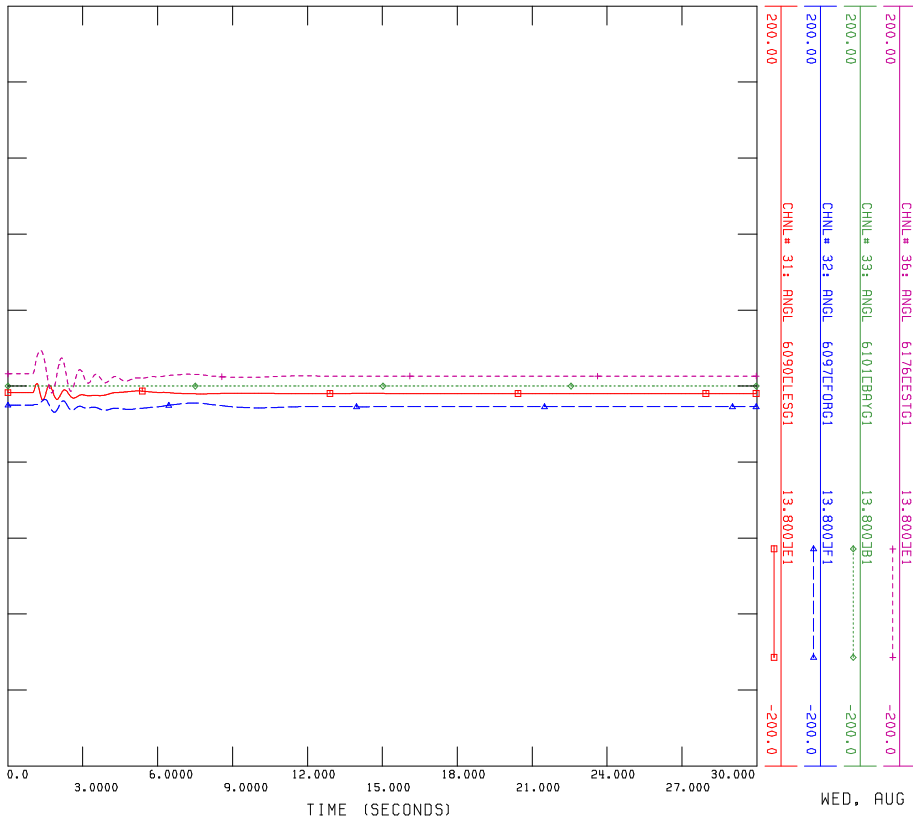
ESCENARIO 2020CR-MODMAX-LUVV - FALLA P019 3FS.  
 ANGULOS RELATIVOS EN MAGNINS TERMICAS.





ESCENARIO 2020CR-MODMAX-LLUV - FALLA P019 3FS.  
ÁNGULOS RELATIVOS EN MÁQUINAS HIDRÁULICAS.

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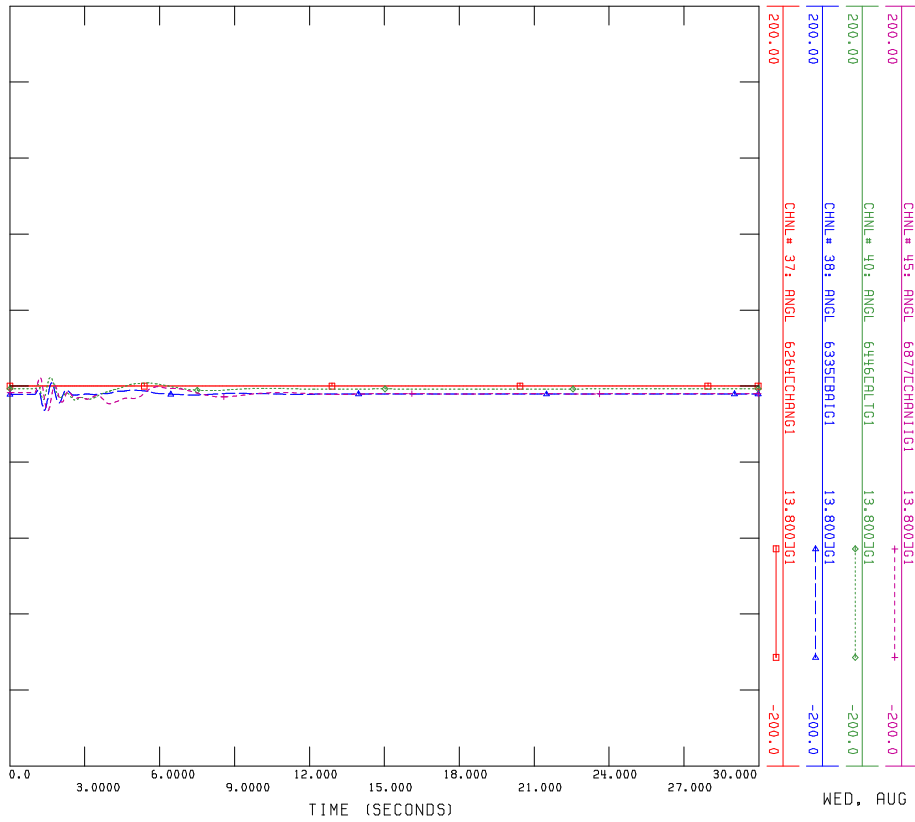
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ESTADO DE  
SERVICIO  
INSTRUMENTOS

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ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

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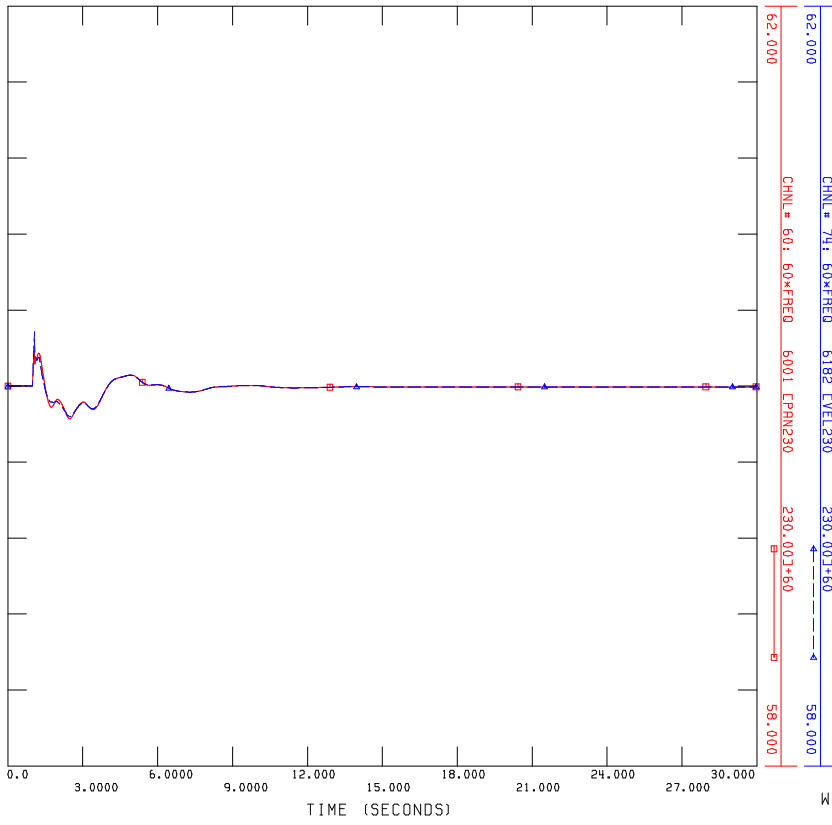
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ESTACION  
DE MONITOREO

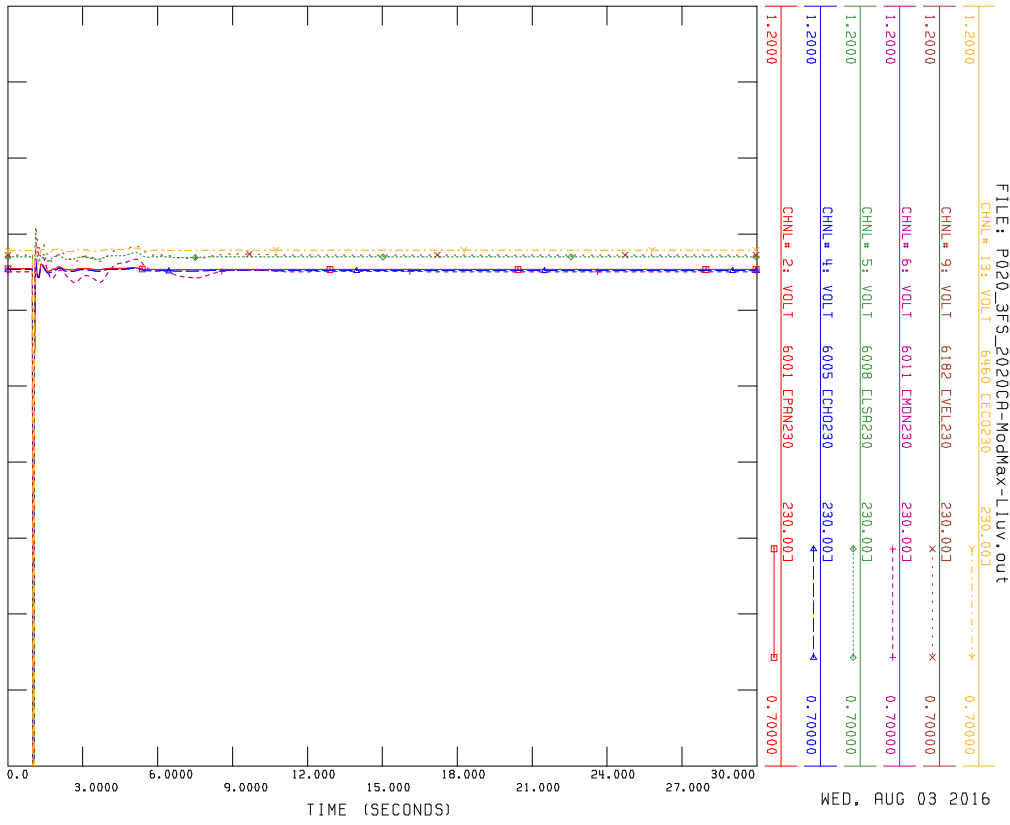
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FRECUENCIAS.

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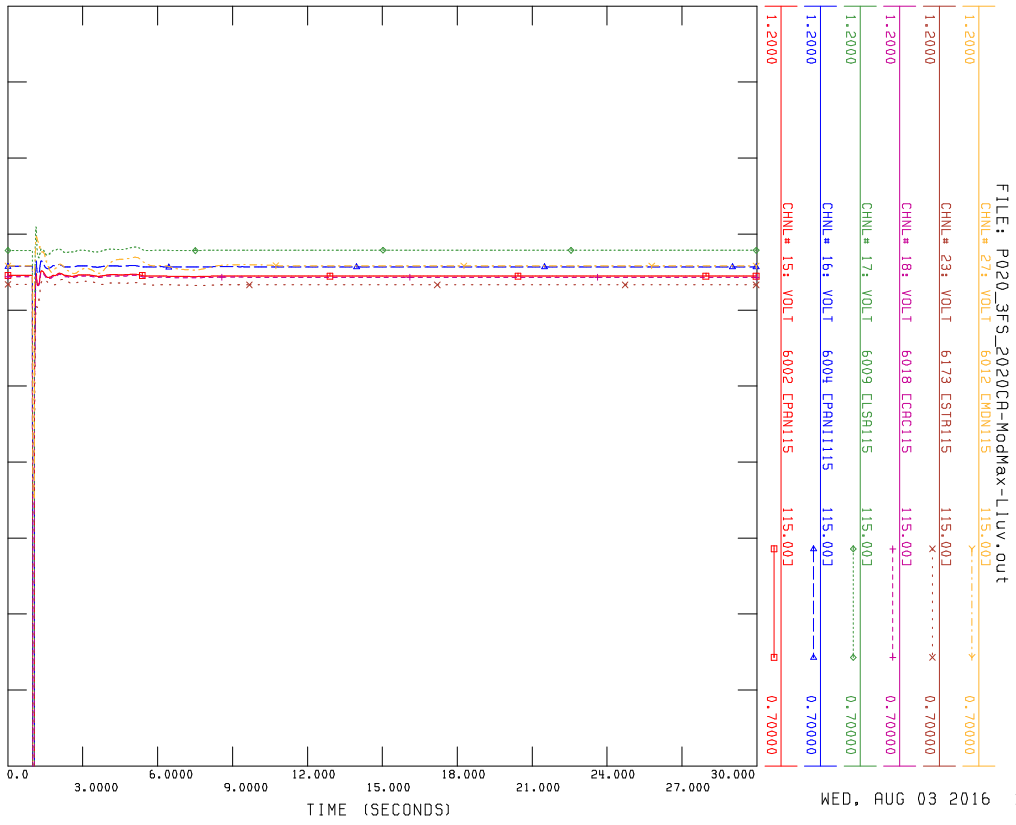
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TENSIONES 230 KV \_ SIN







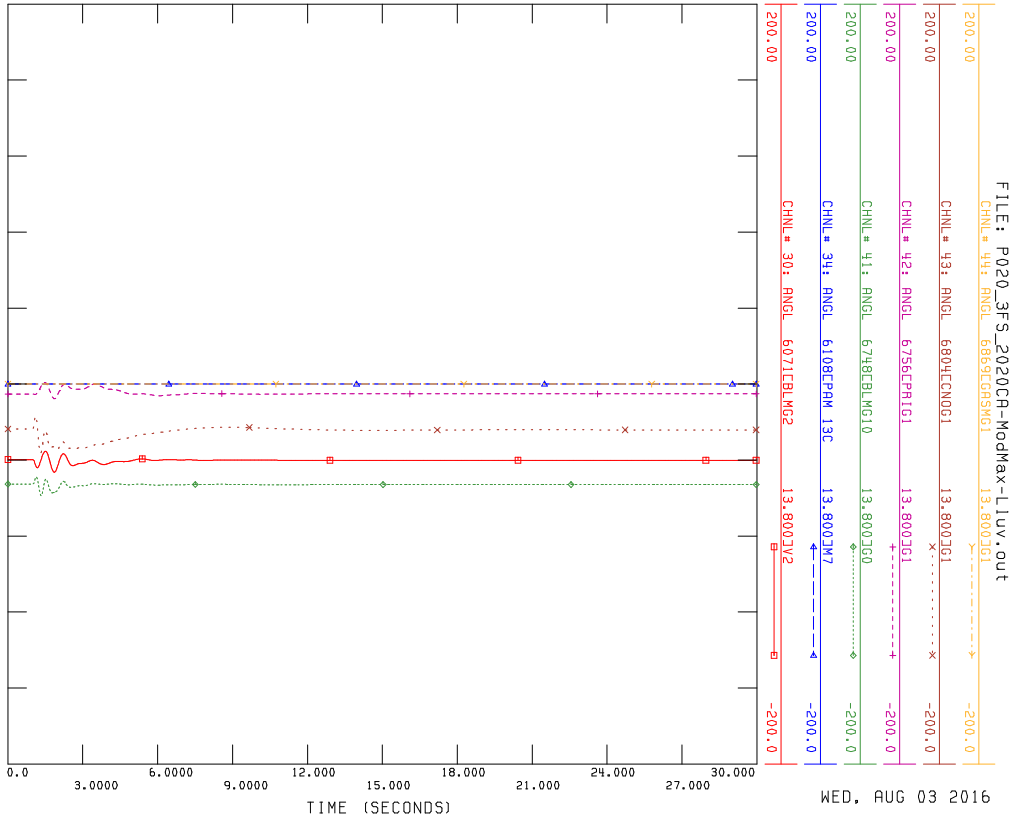
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TENSIONES 115 KV - SIN



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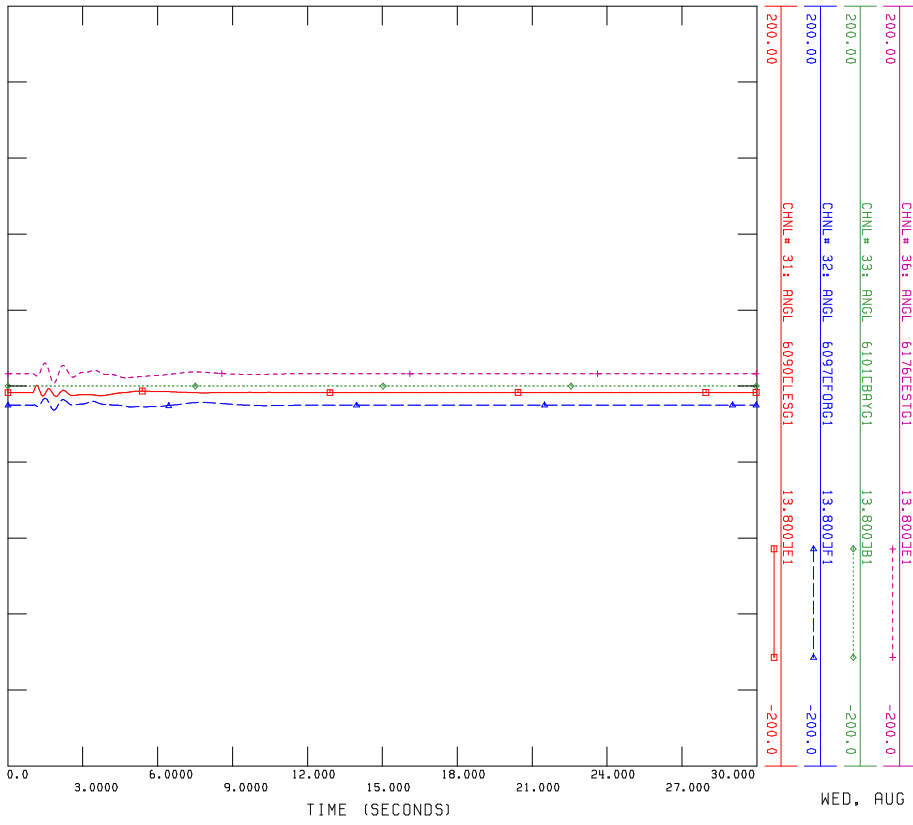
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 ANGULOS RELATIVOS EN MAGNINS TERMICAS.





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ANULOS RELATIVOS EN MQUINRS HIDRAULICAS.

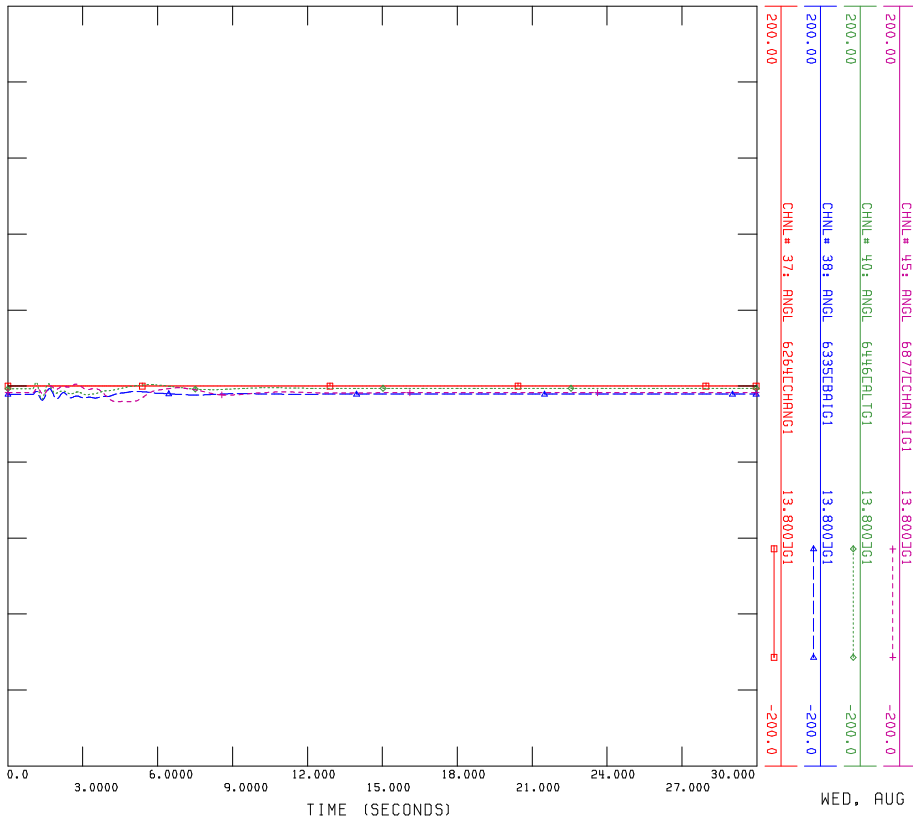
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 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

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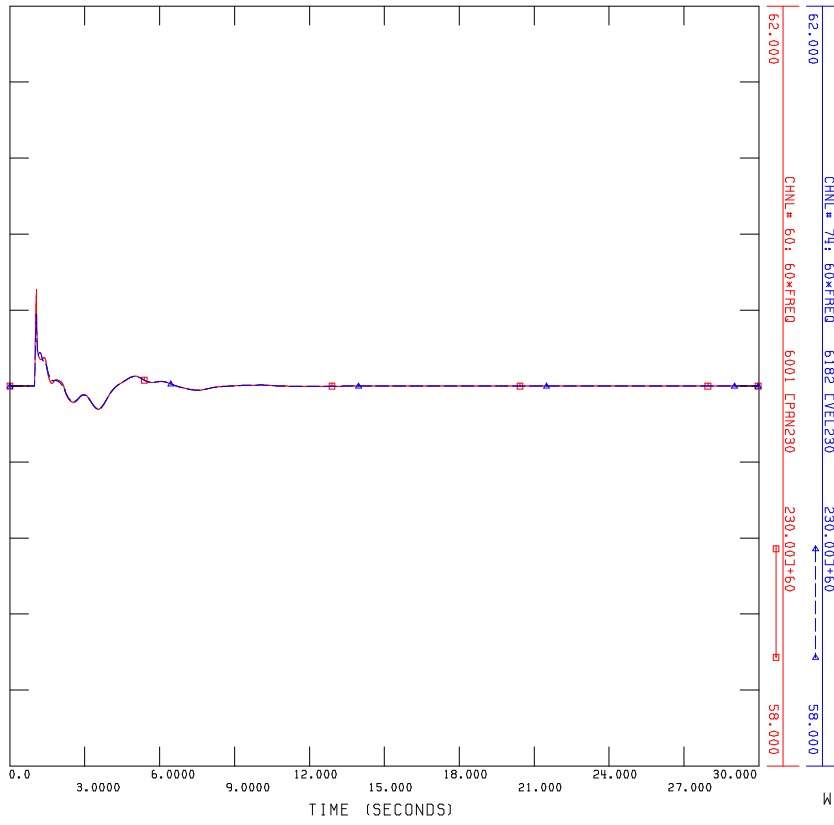
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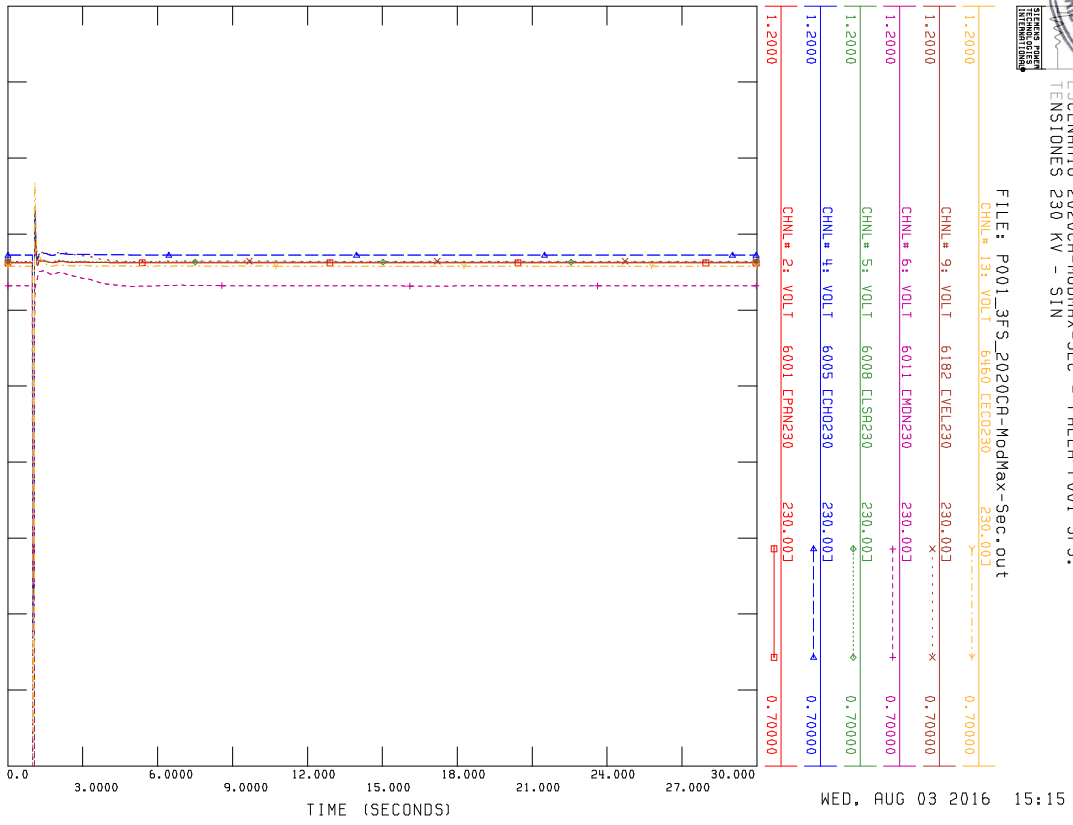
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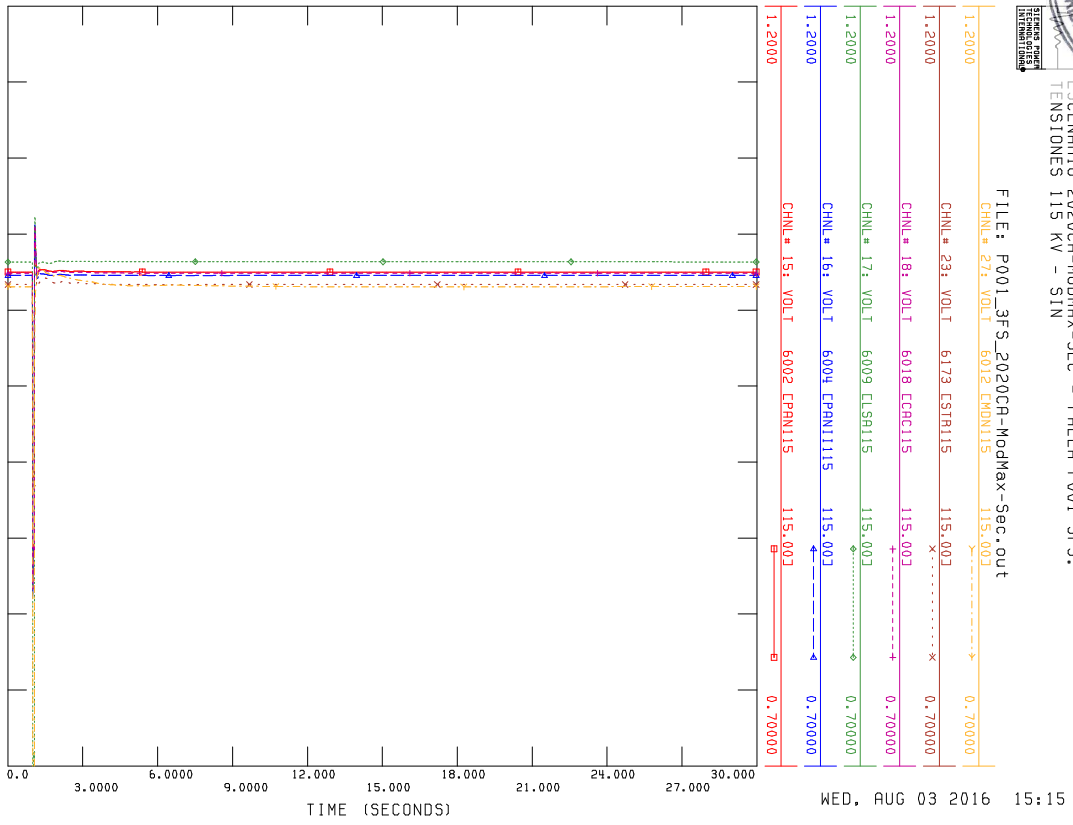
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FRECUENCIAS.

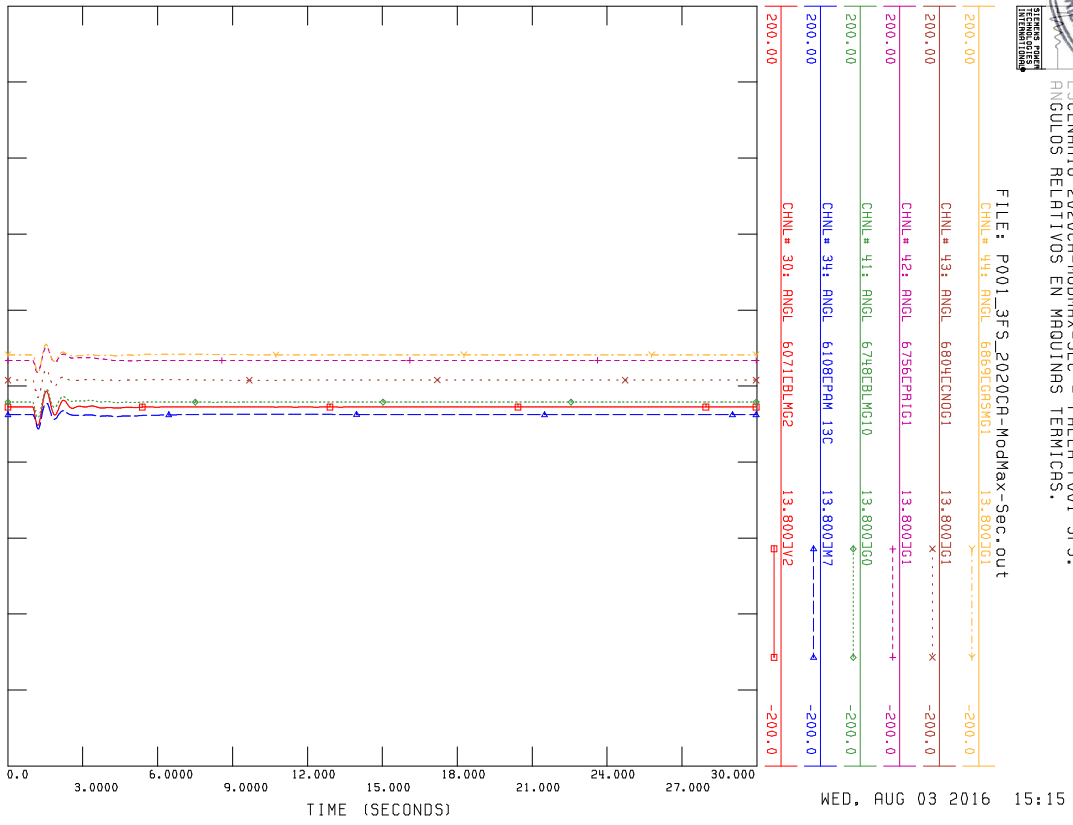
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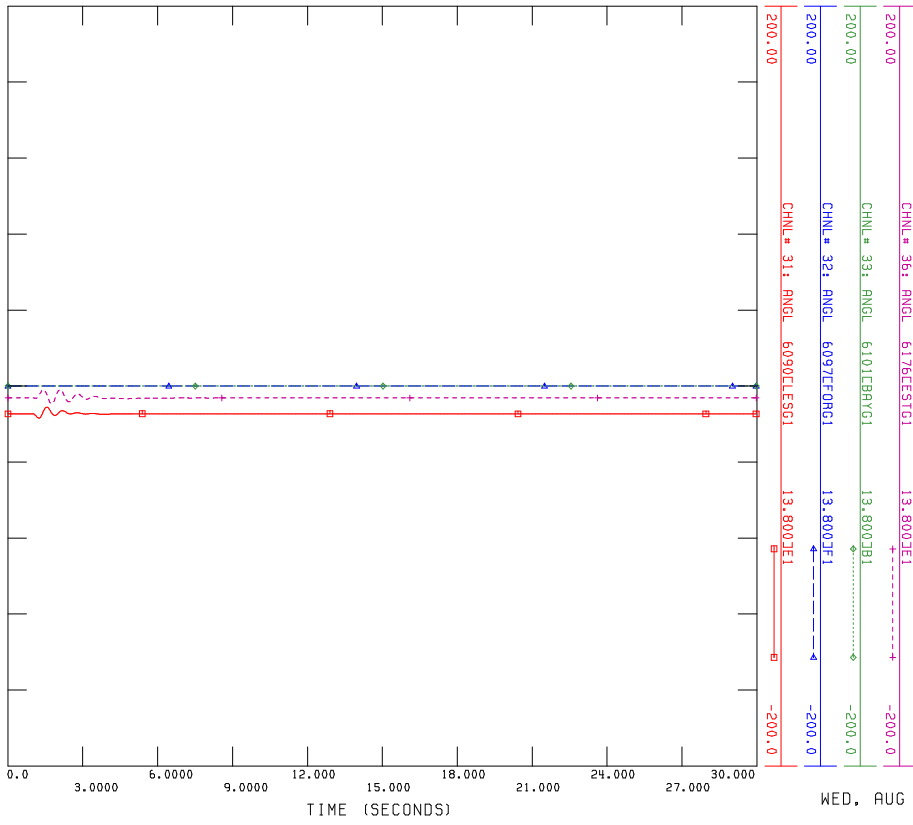






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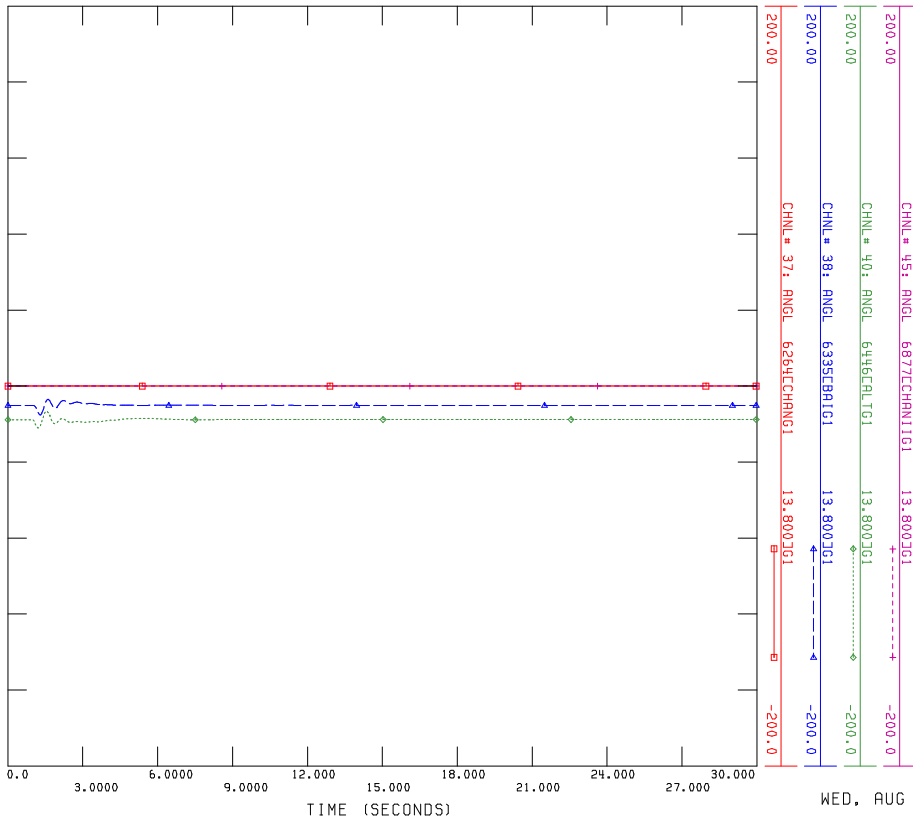


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 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

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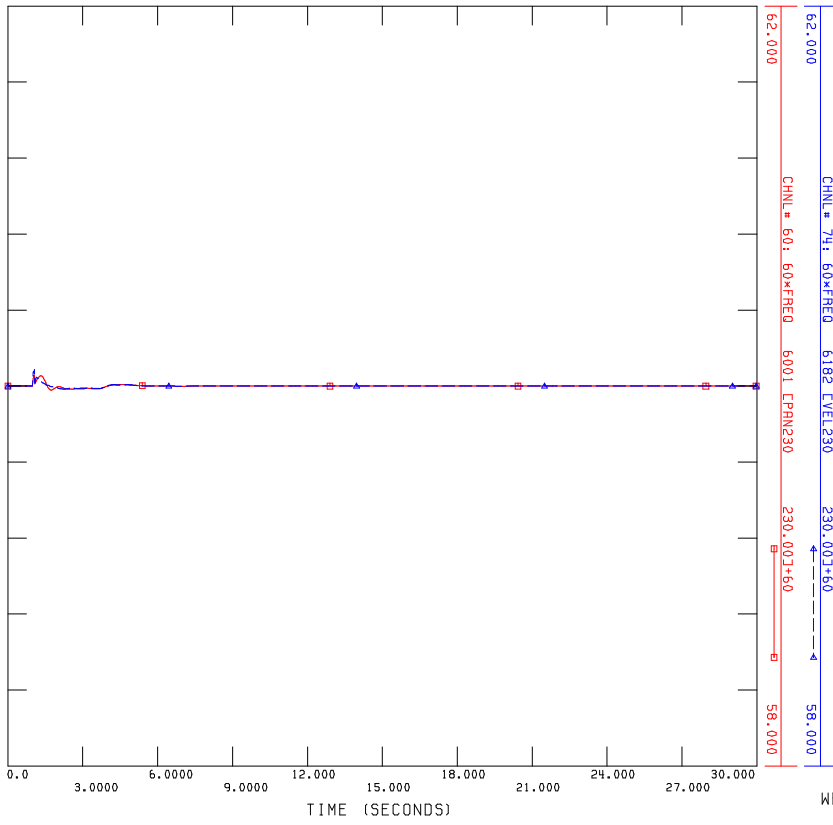
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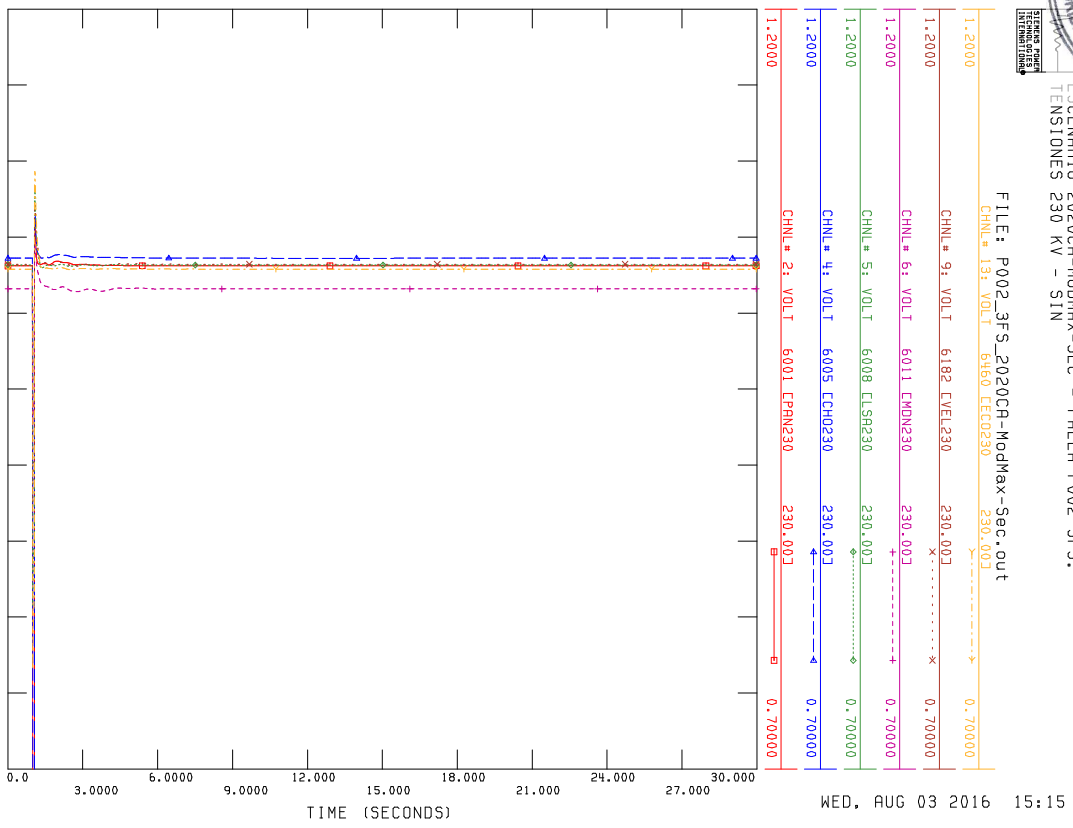
ESTACION  
DE MONITOREO

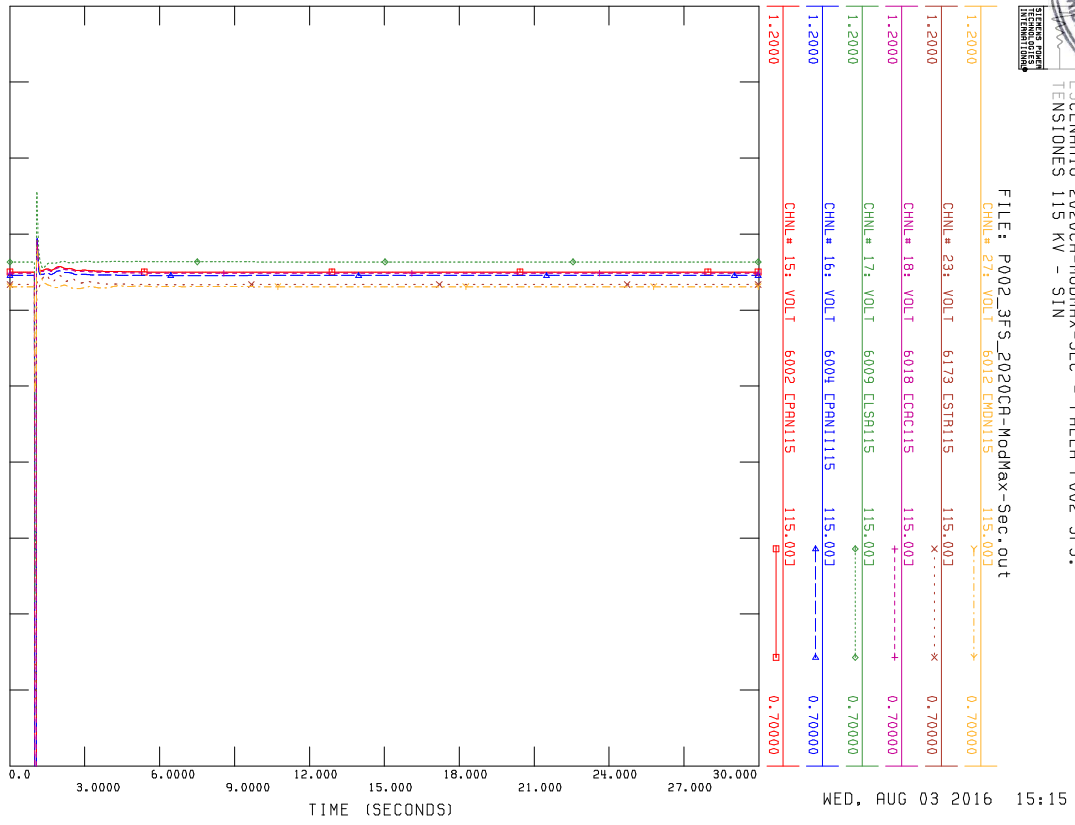
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FRECUENCIAS.

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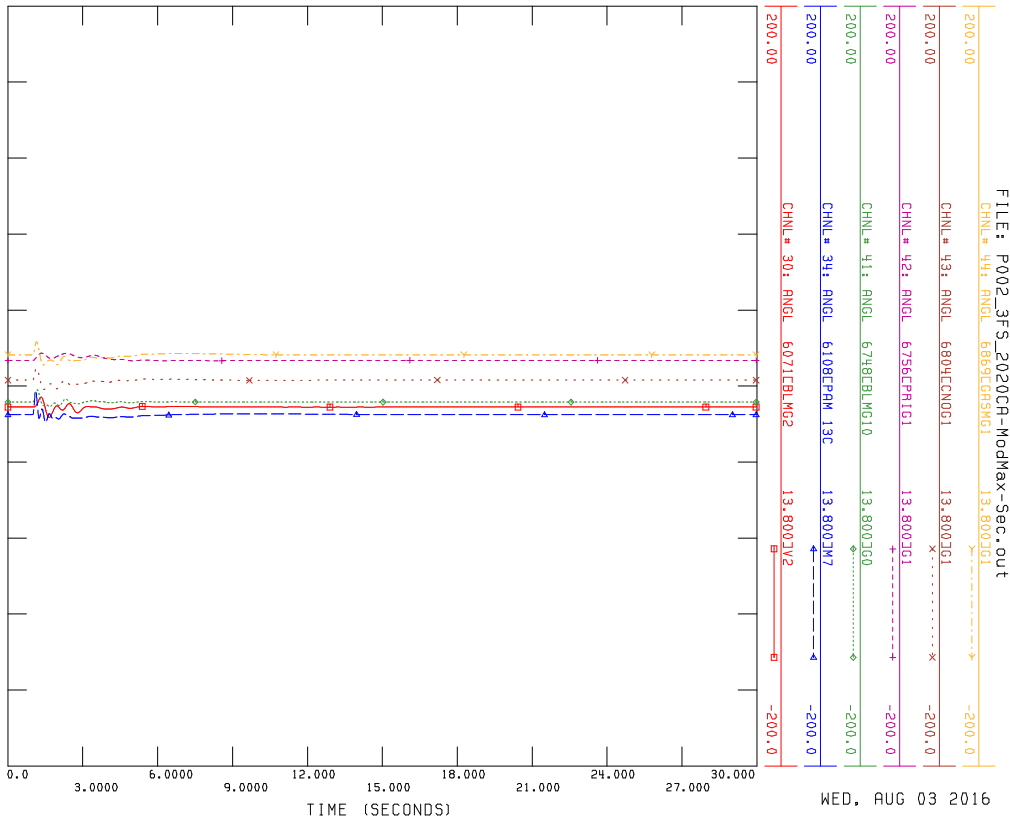
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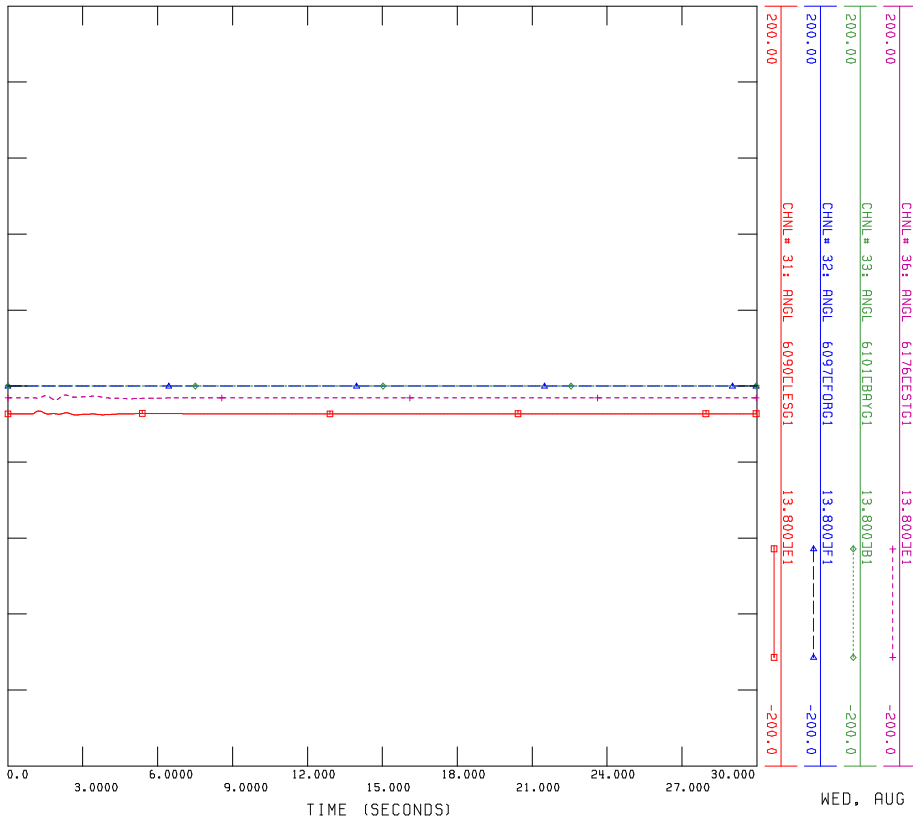
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 ANGULOS RELATIVOS EN MQUJINS TERCIMCS.





ESCENARIO 2020CA-MODMAX-SEC - FALLA P002 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

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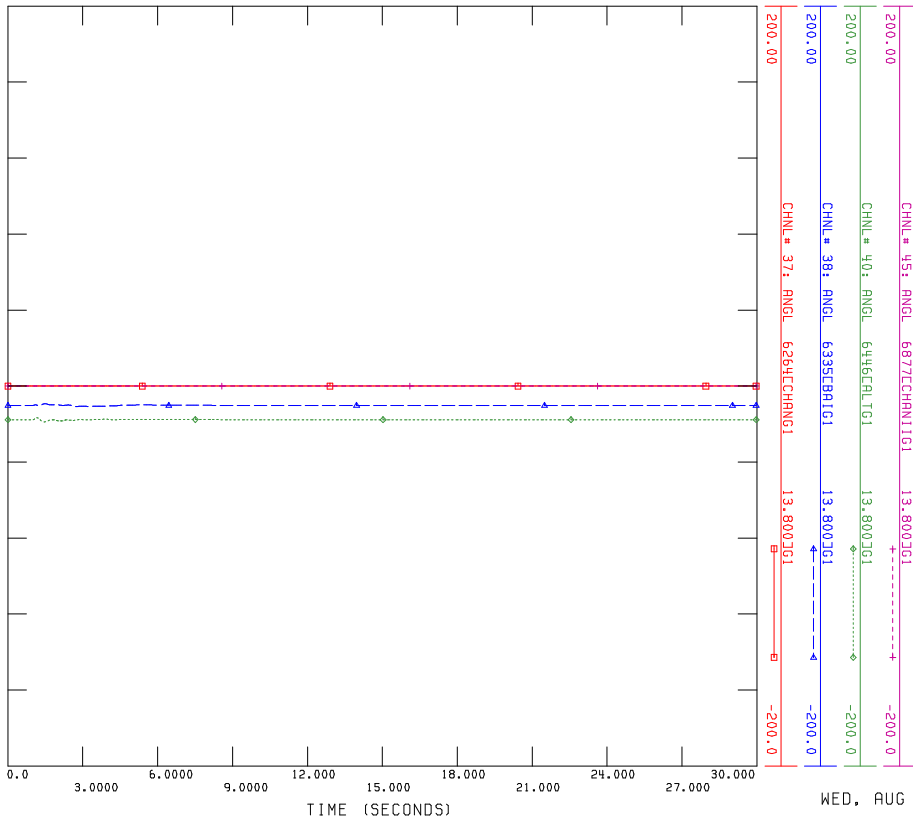


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 ANGULOS RELATIVOS EN MAGUINNS HIDRAULICAS.

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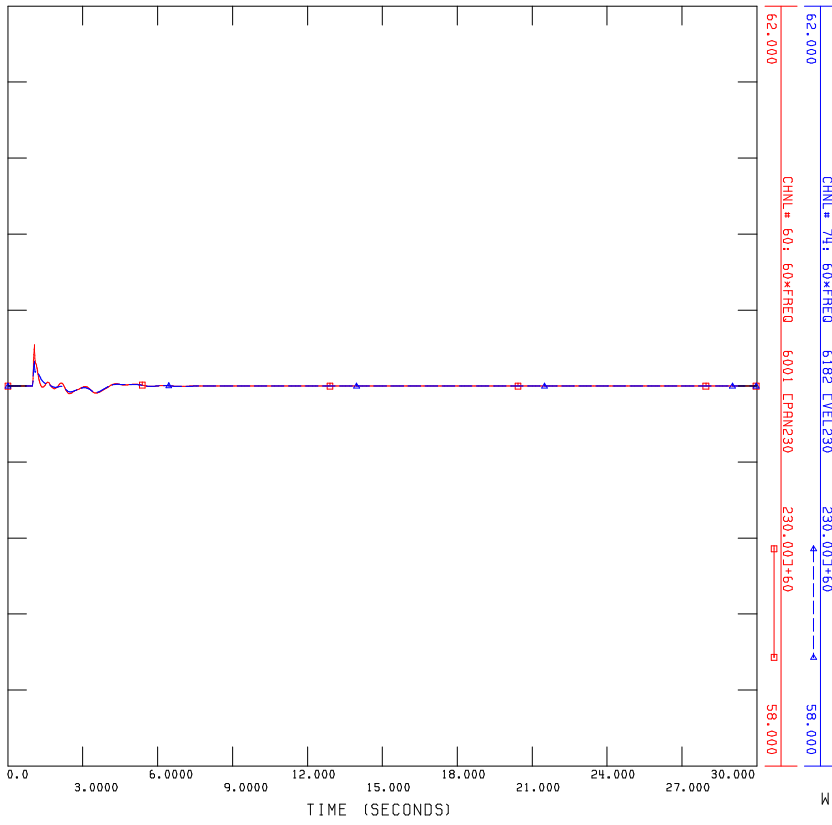




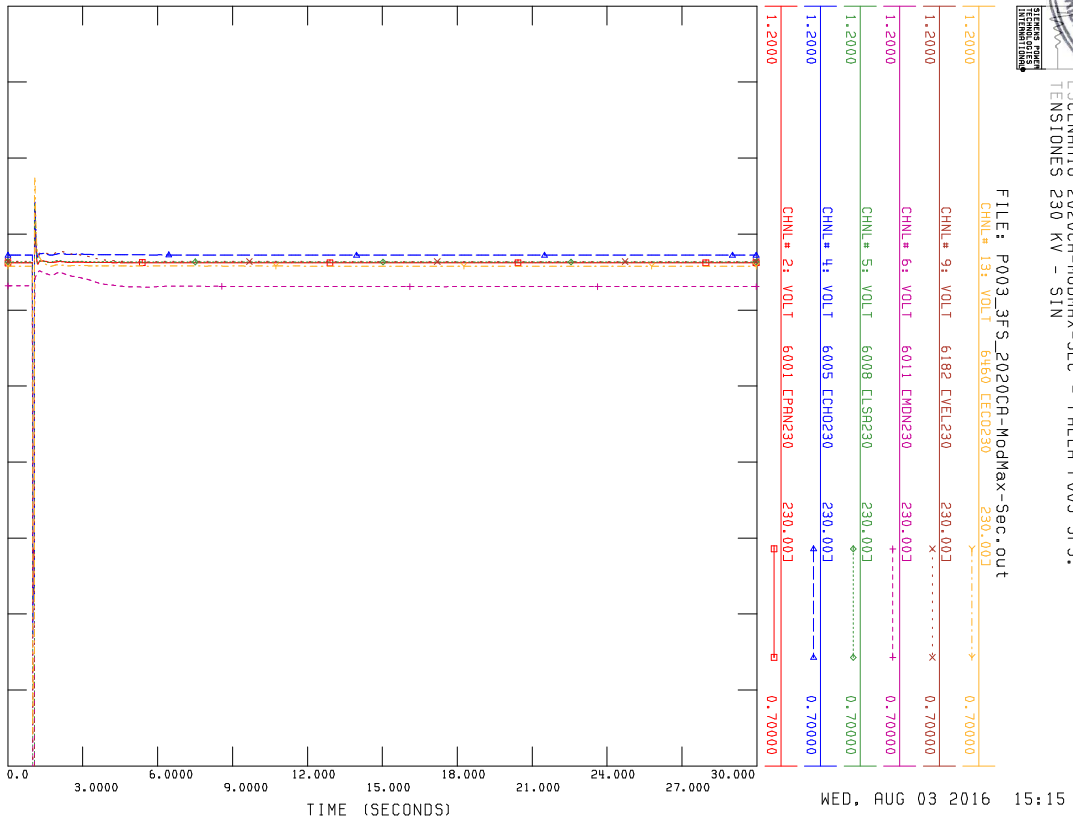
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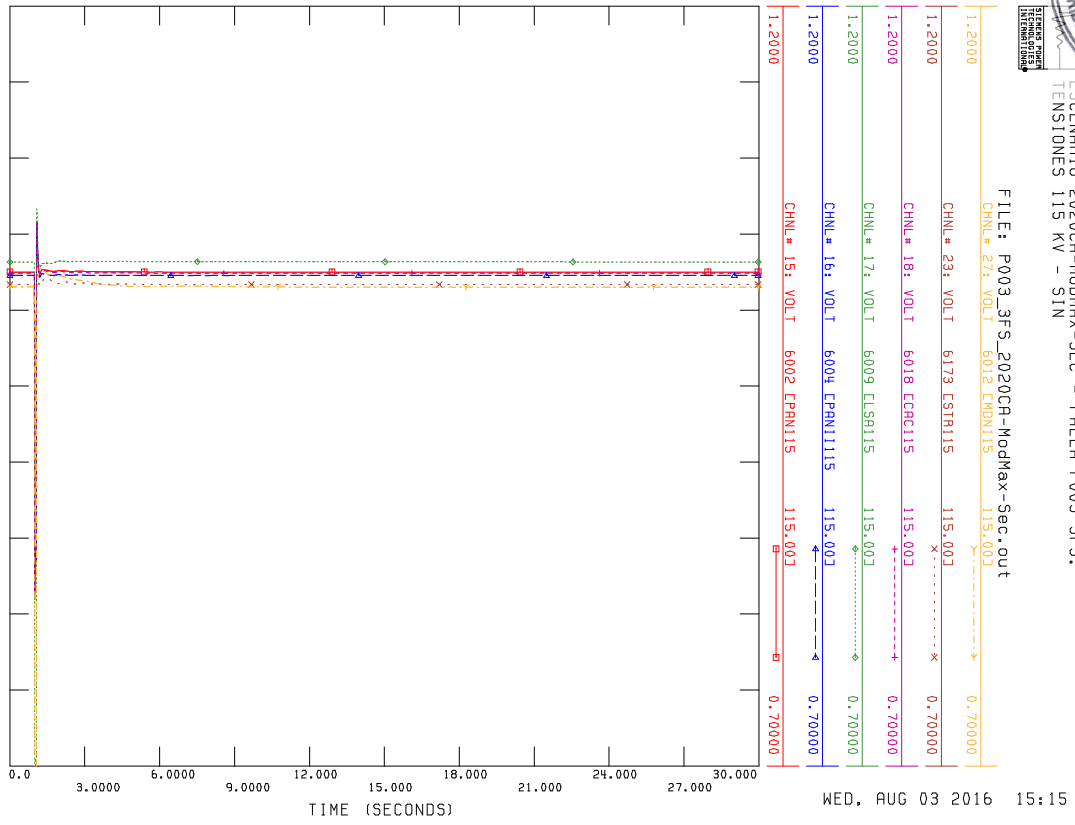
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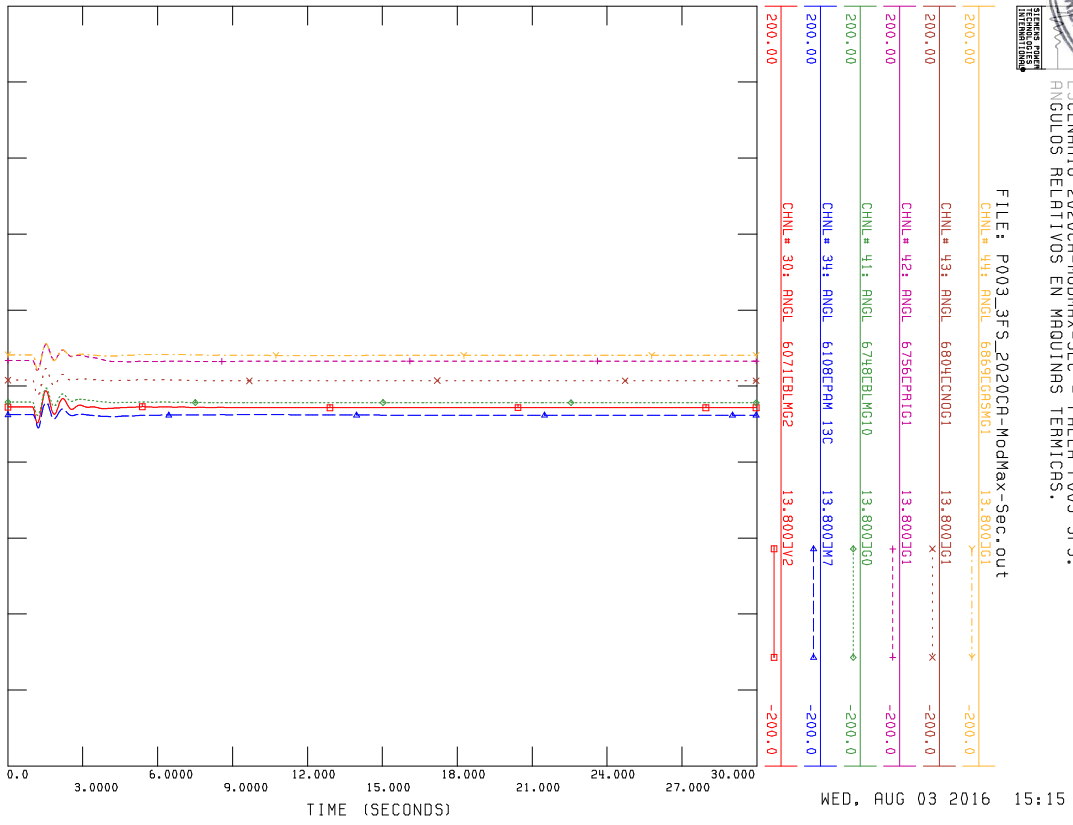
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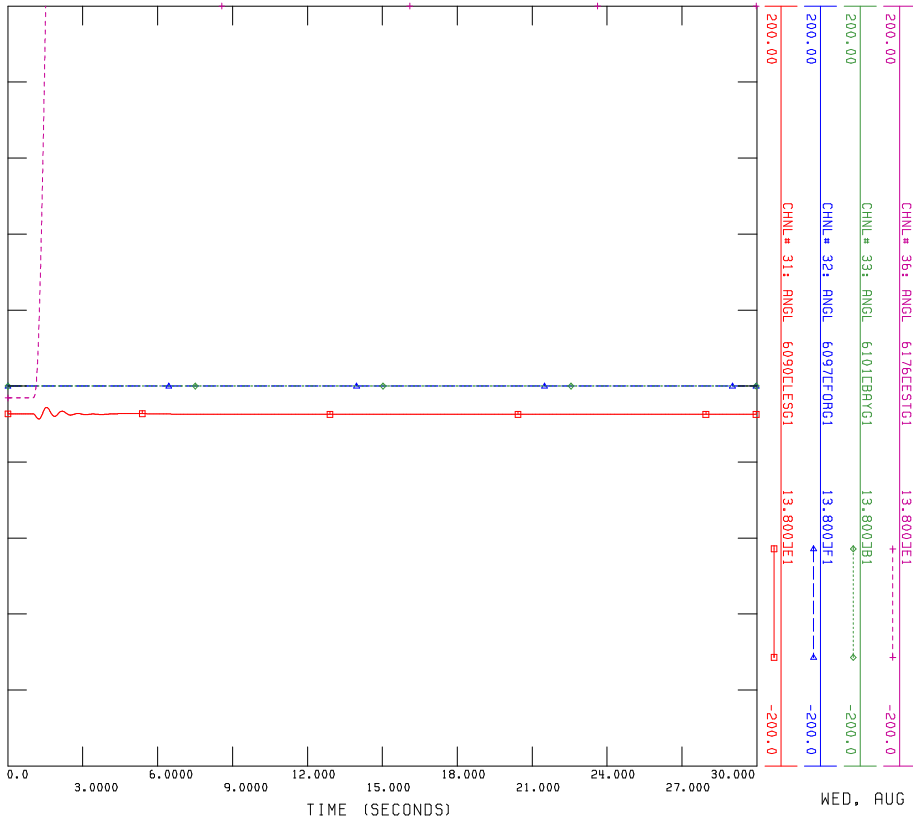






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 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

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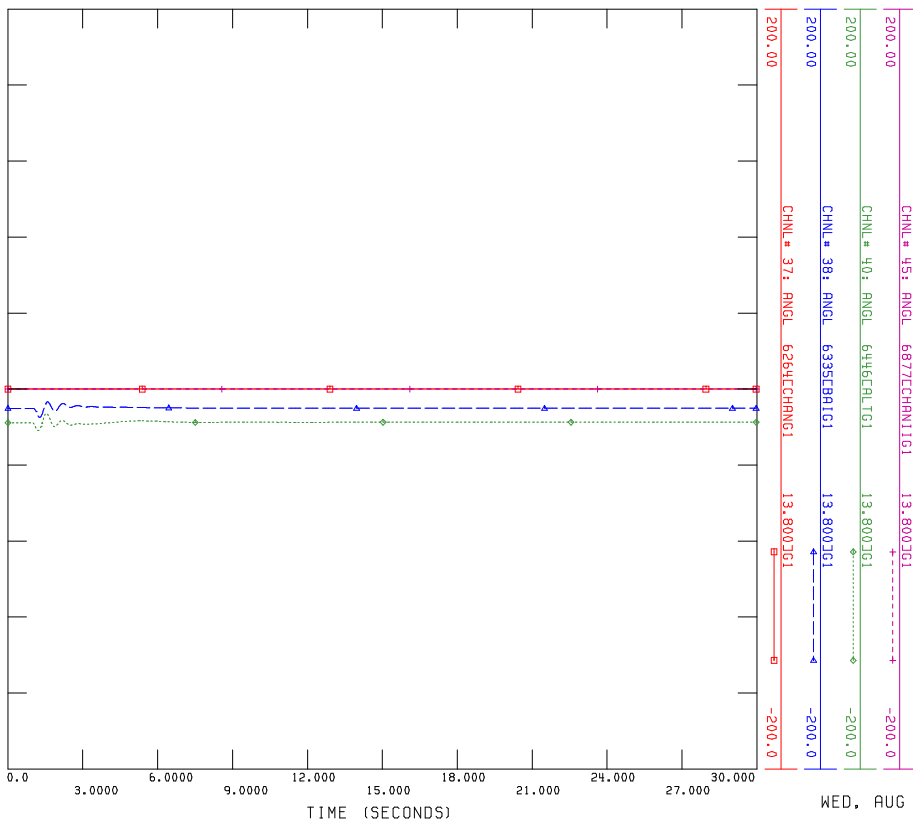


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P003 3FS.  
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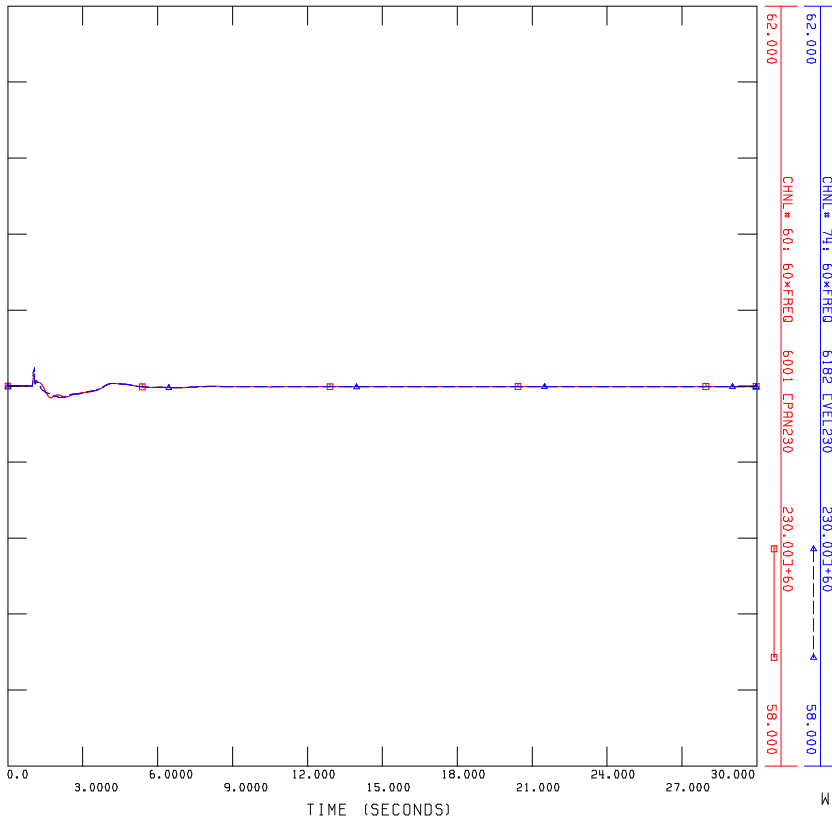


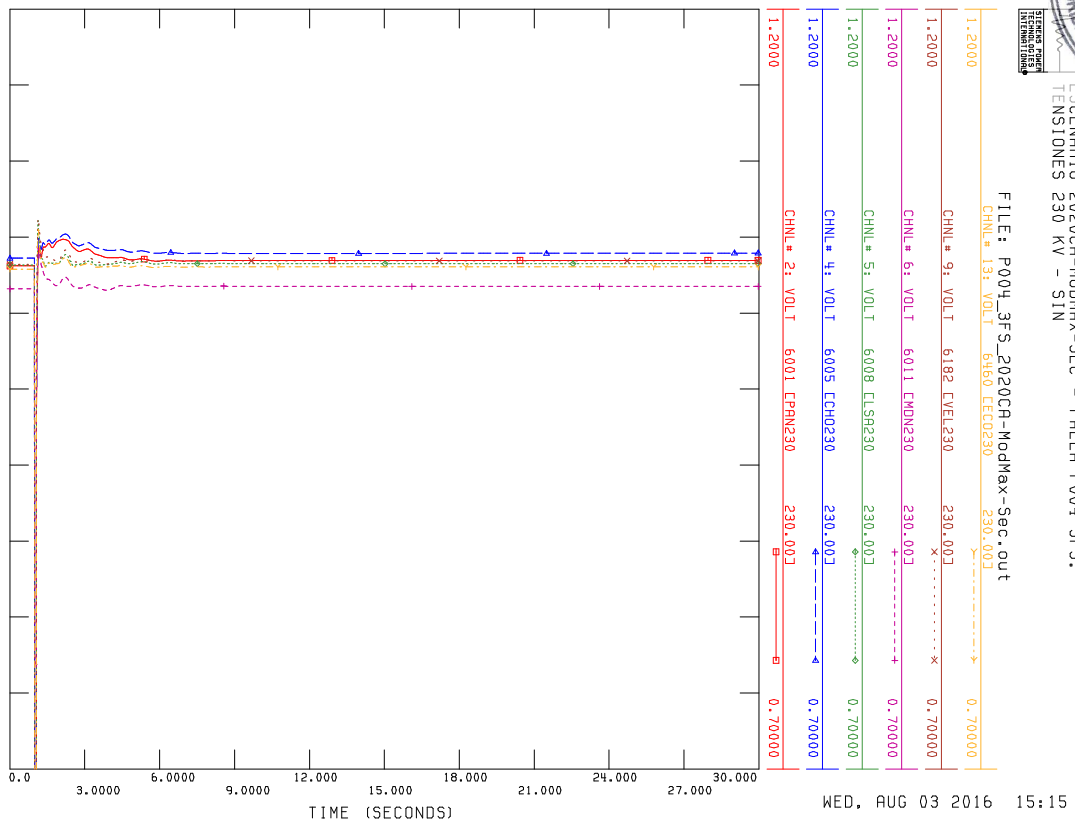
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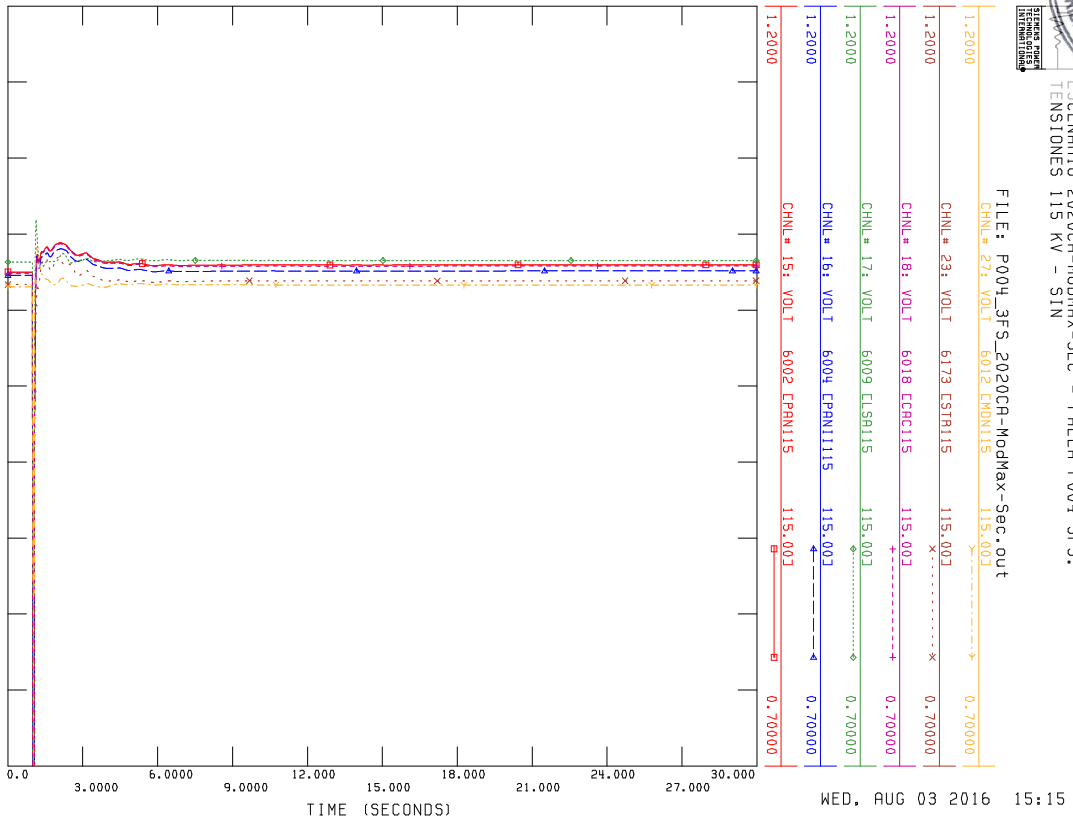
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FRECUENCIAS.

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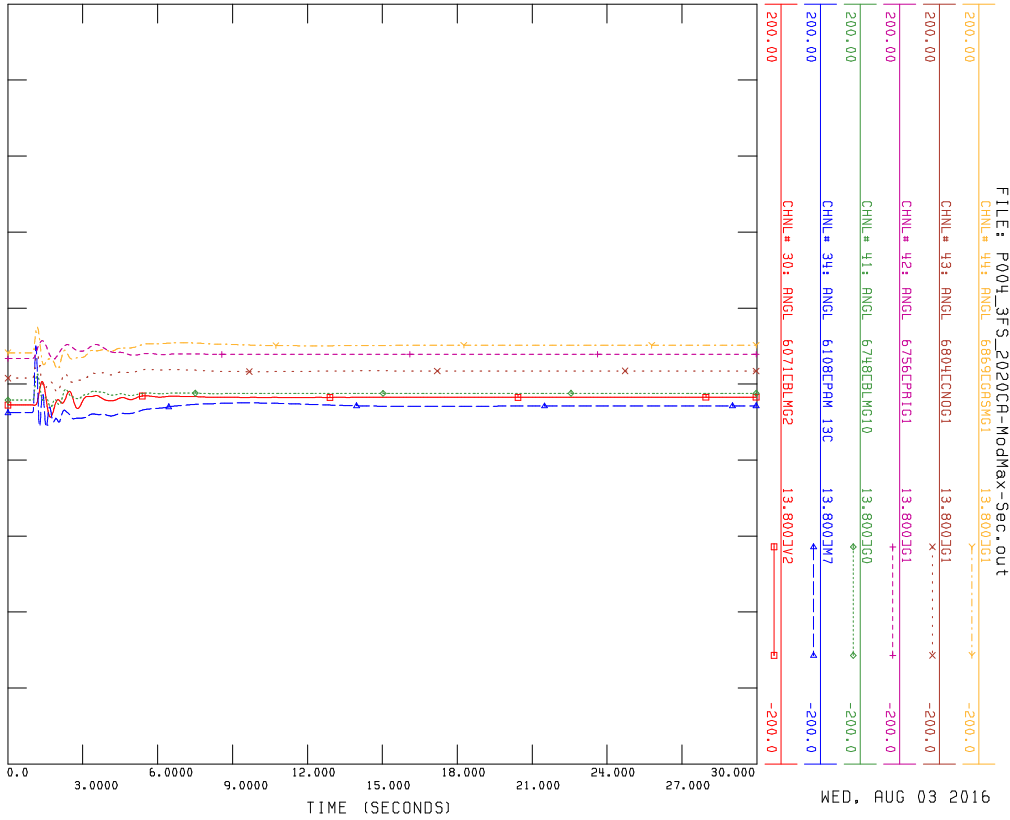








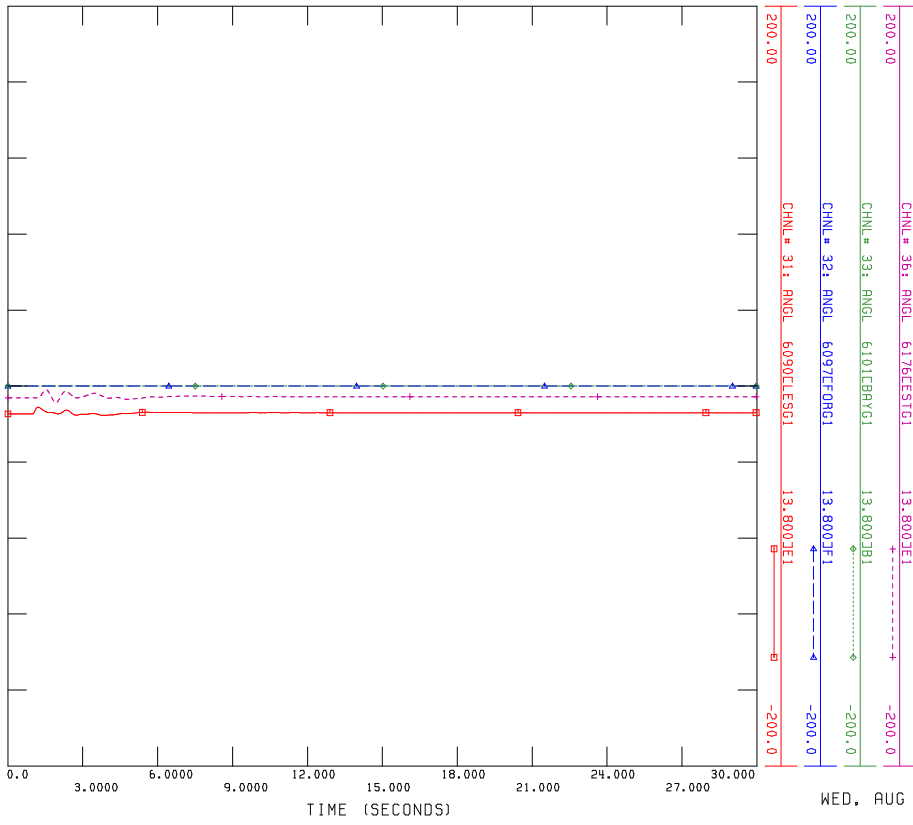
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 ANGULOS RELATIVOS EN MÁQUINAS TÉRMICAS.





ESCENARIO 2020CA-MODMAX-SEC - FALLA P004 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

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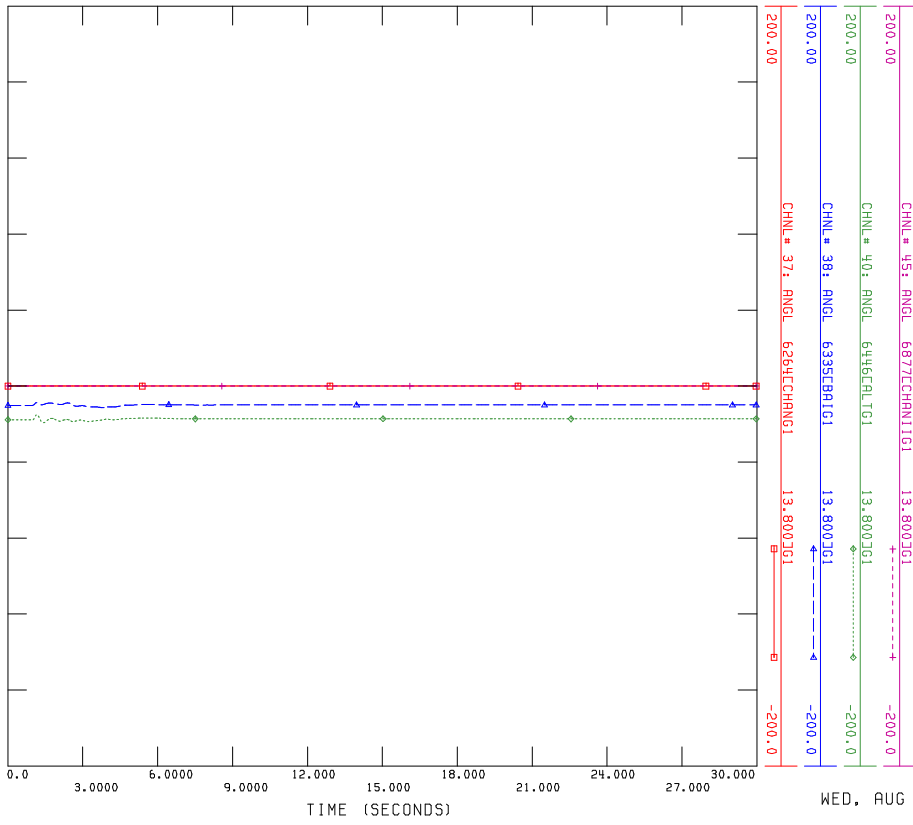


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P004 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

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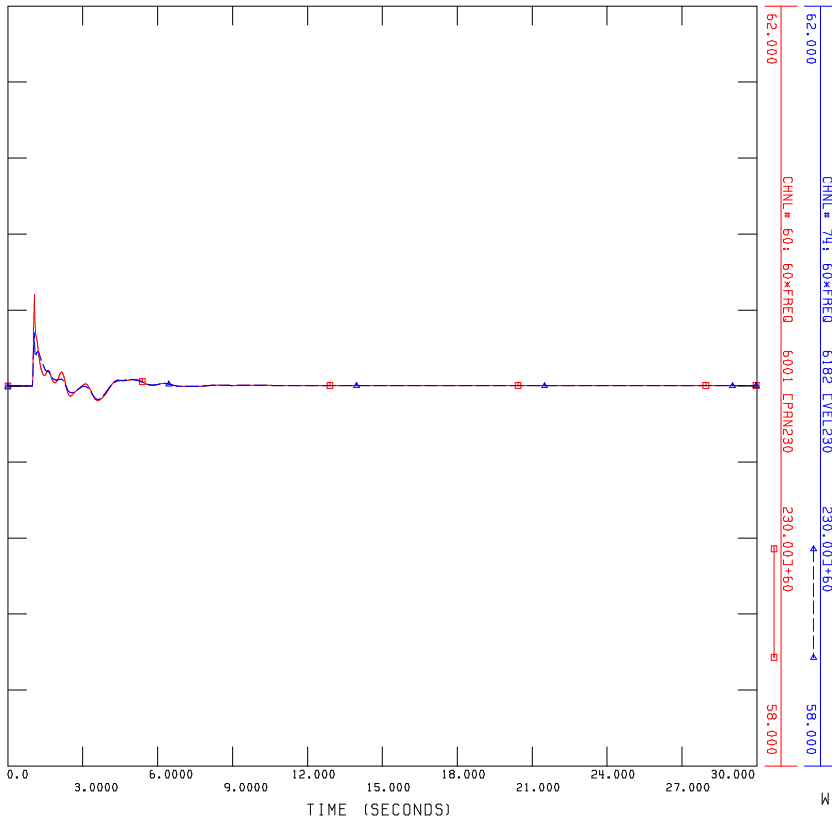


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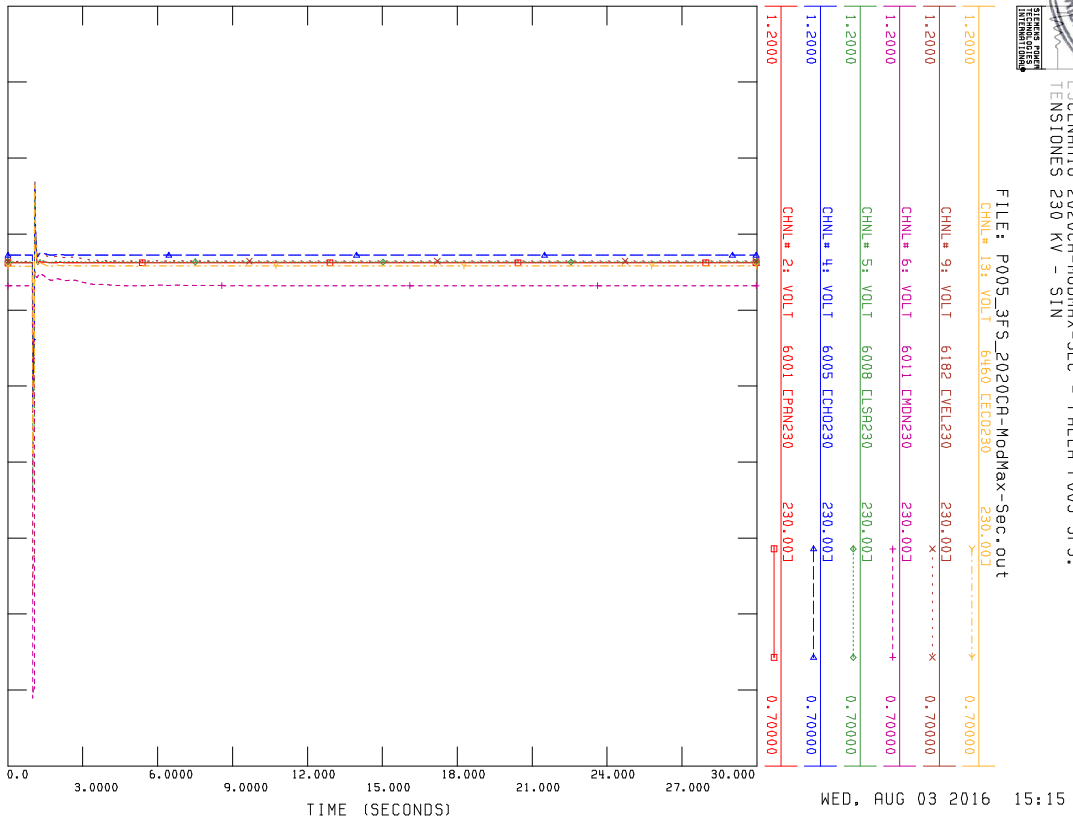


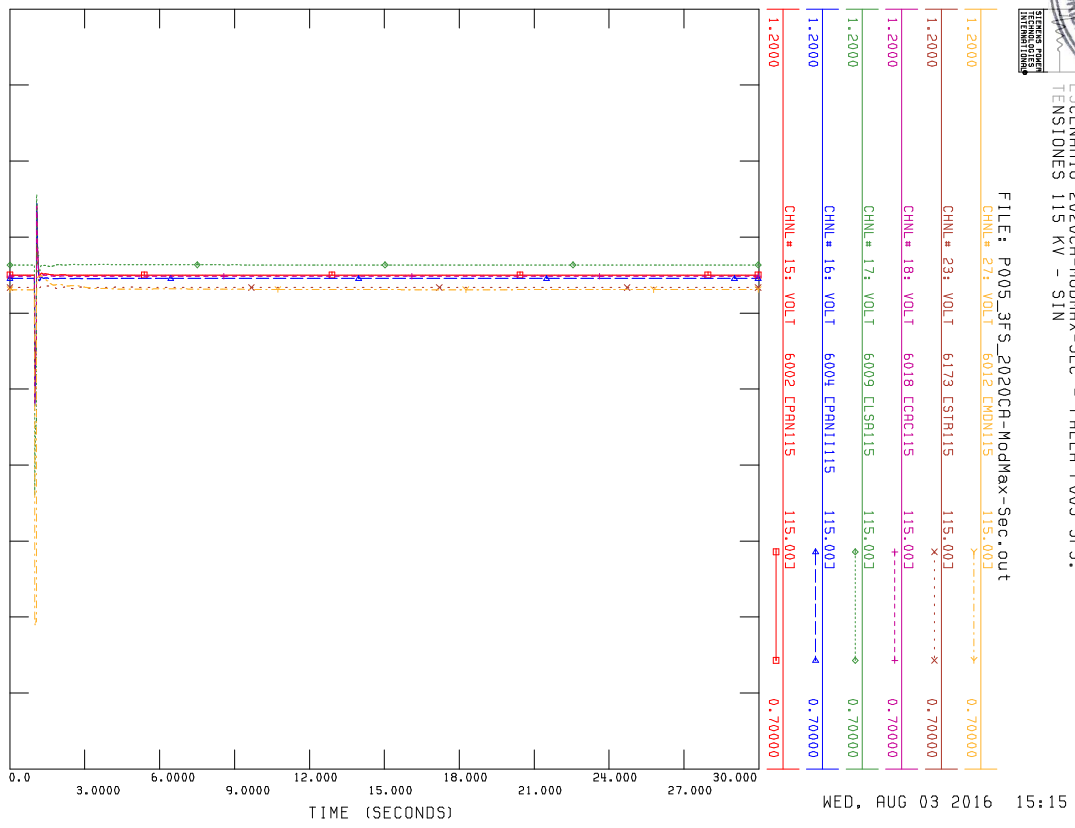
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FRECUENCIAS.

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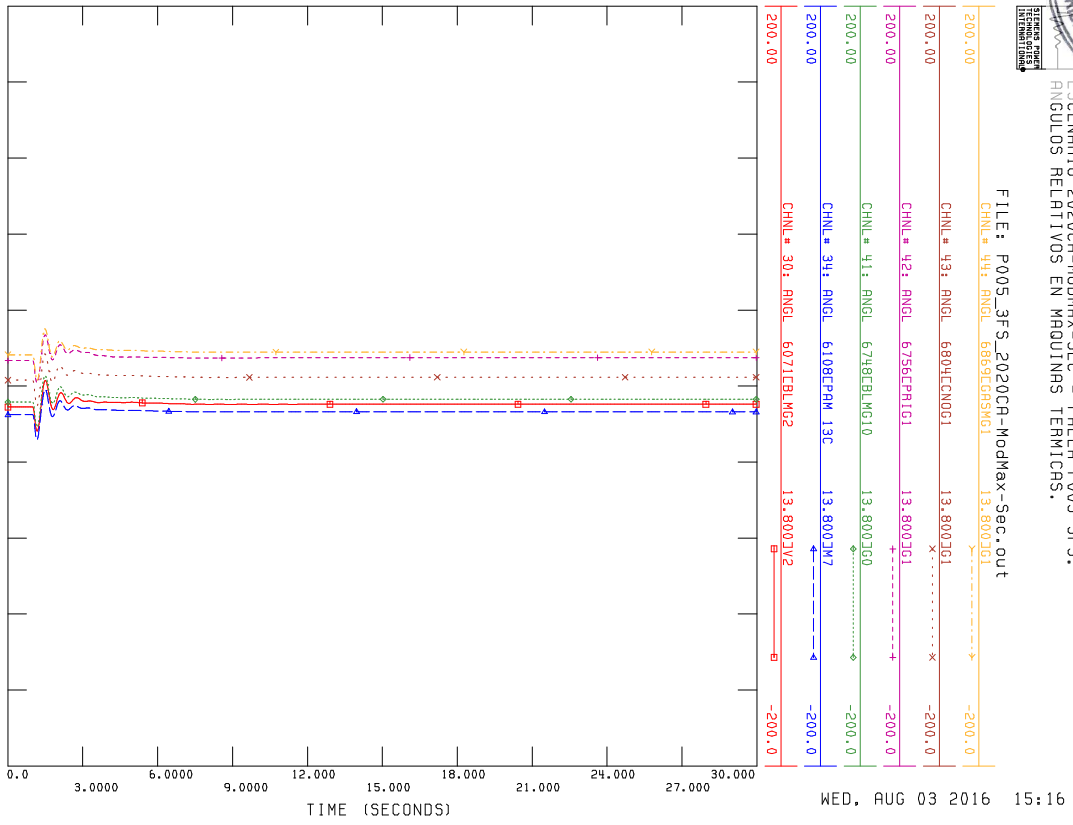


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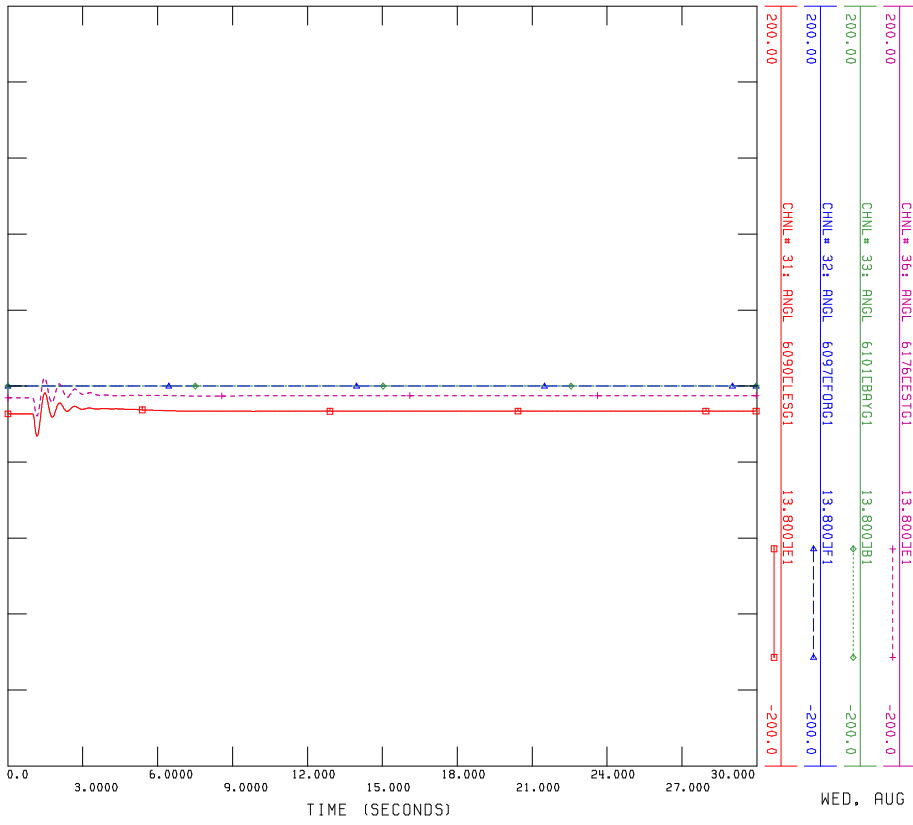






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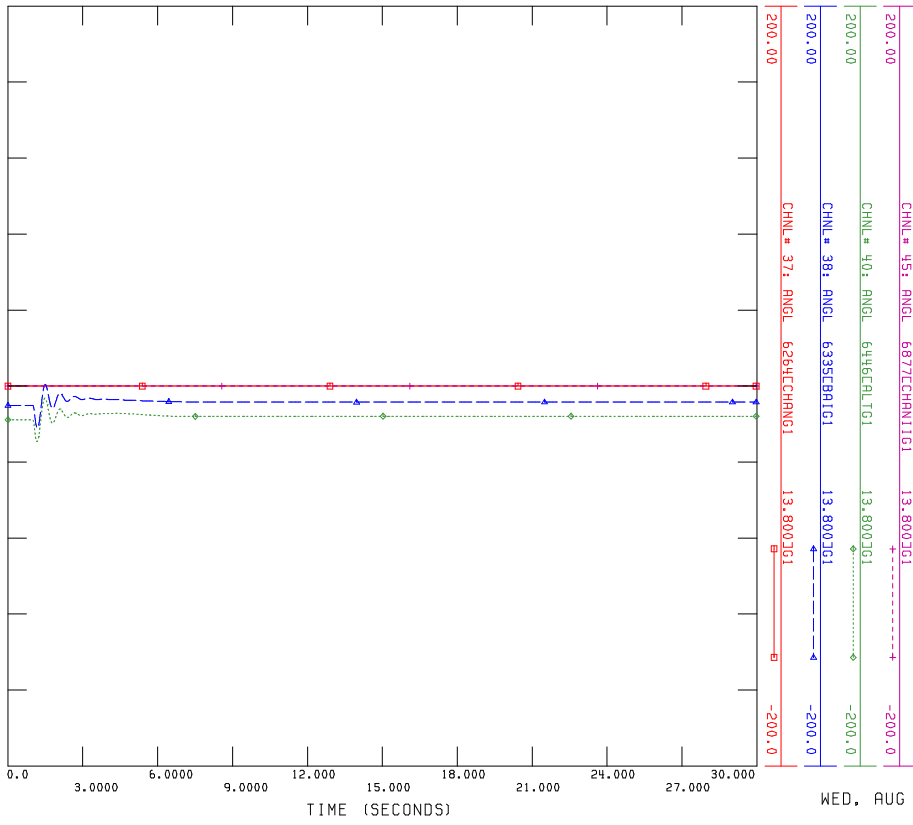


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P005 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

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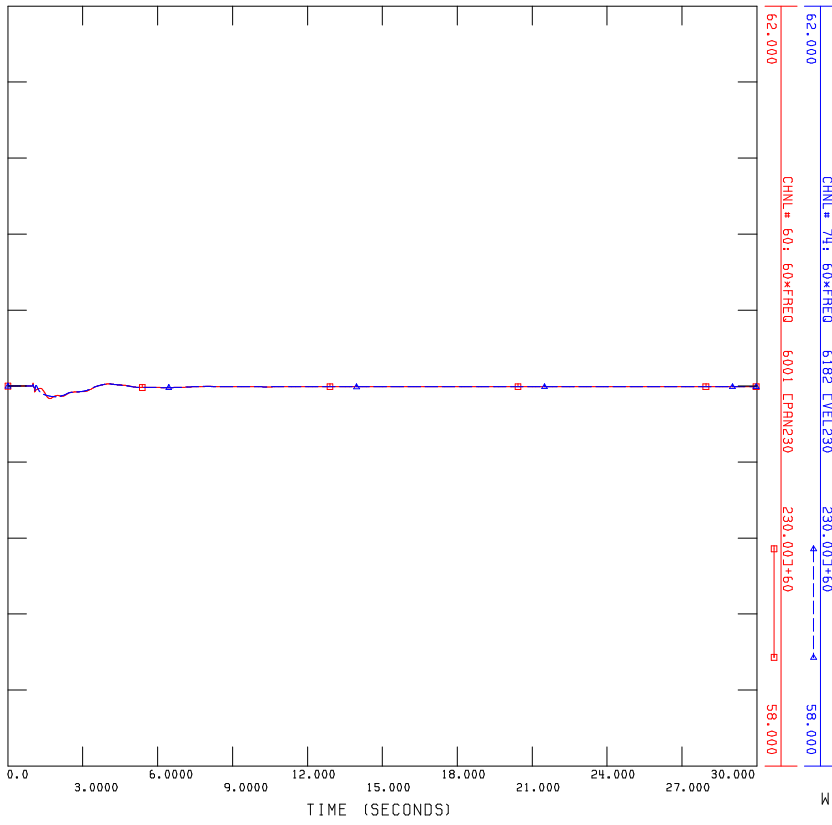
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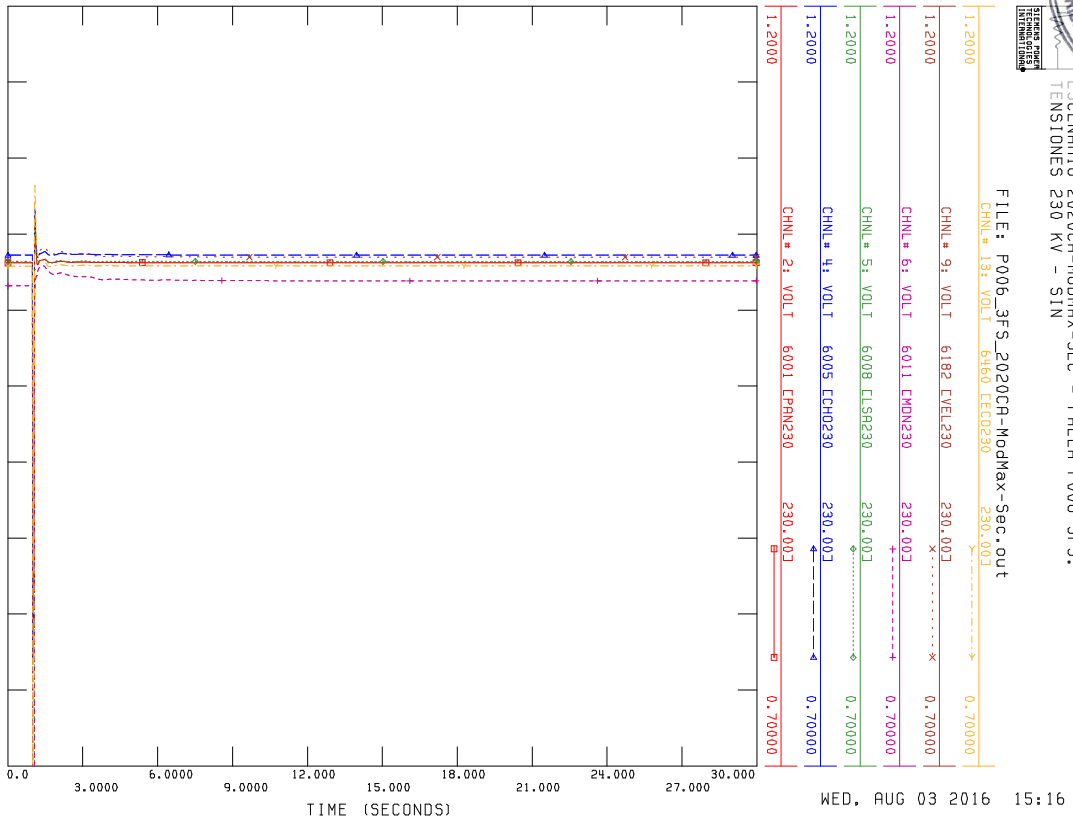
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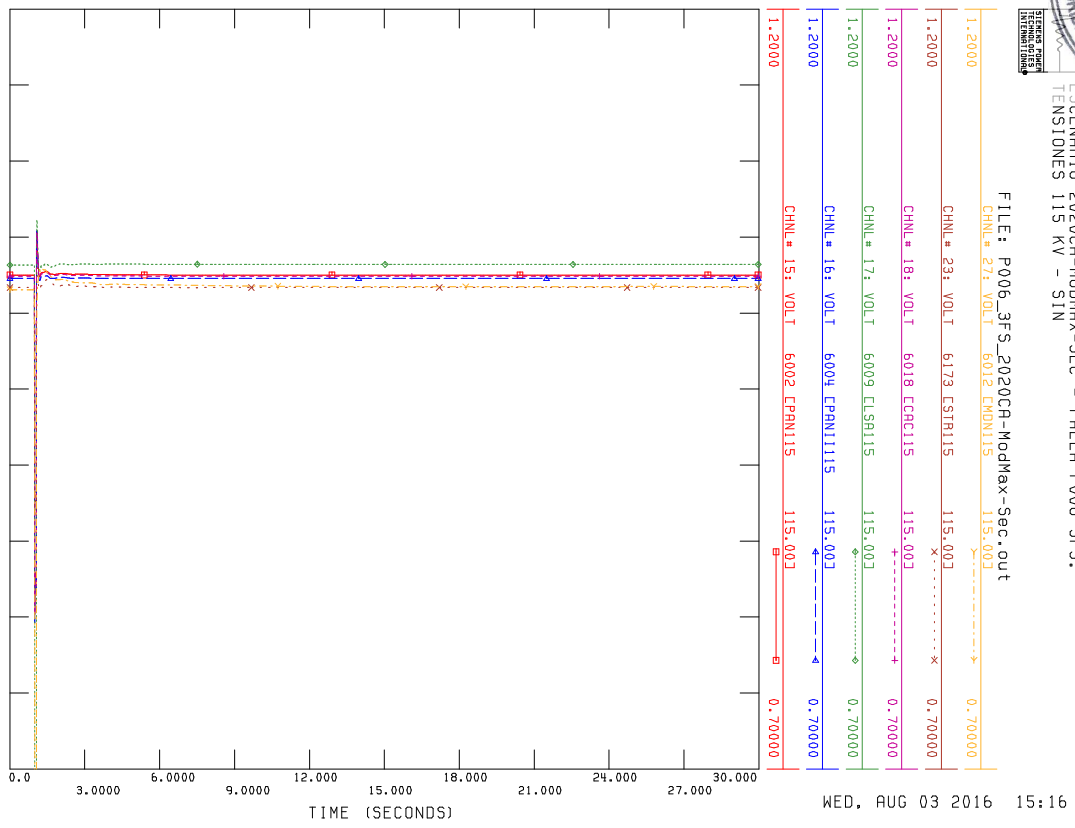
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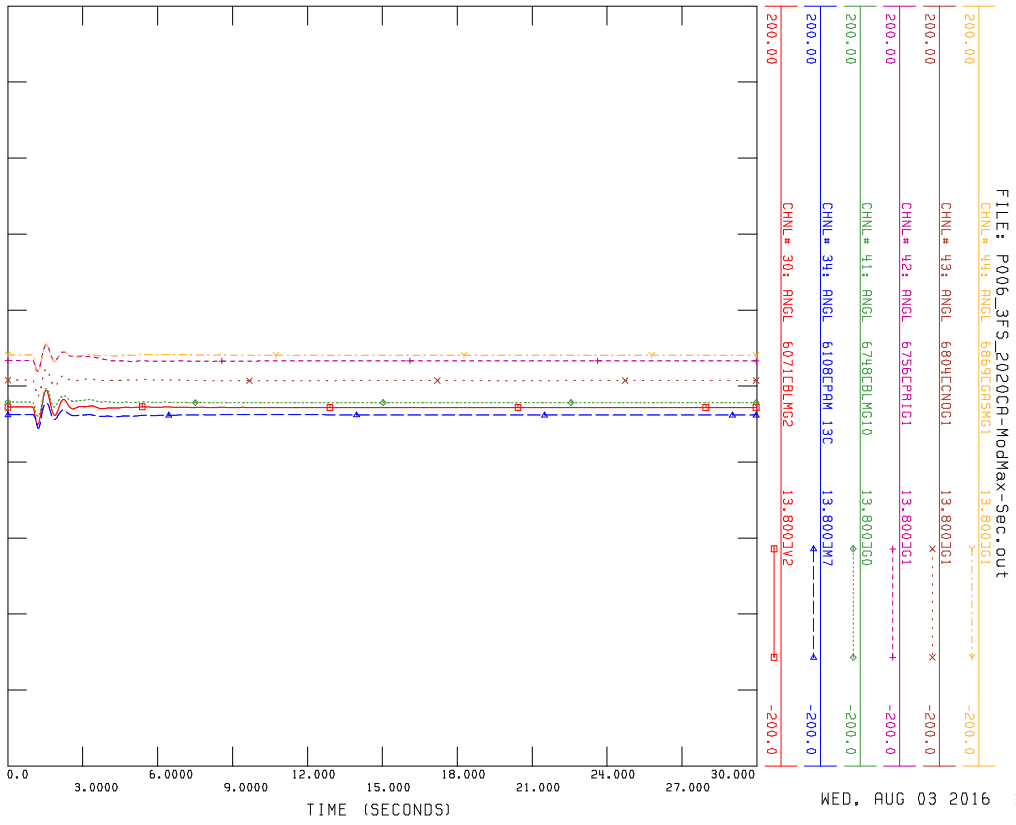
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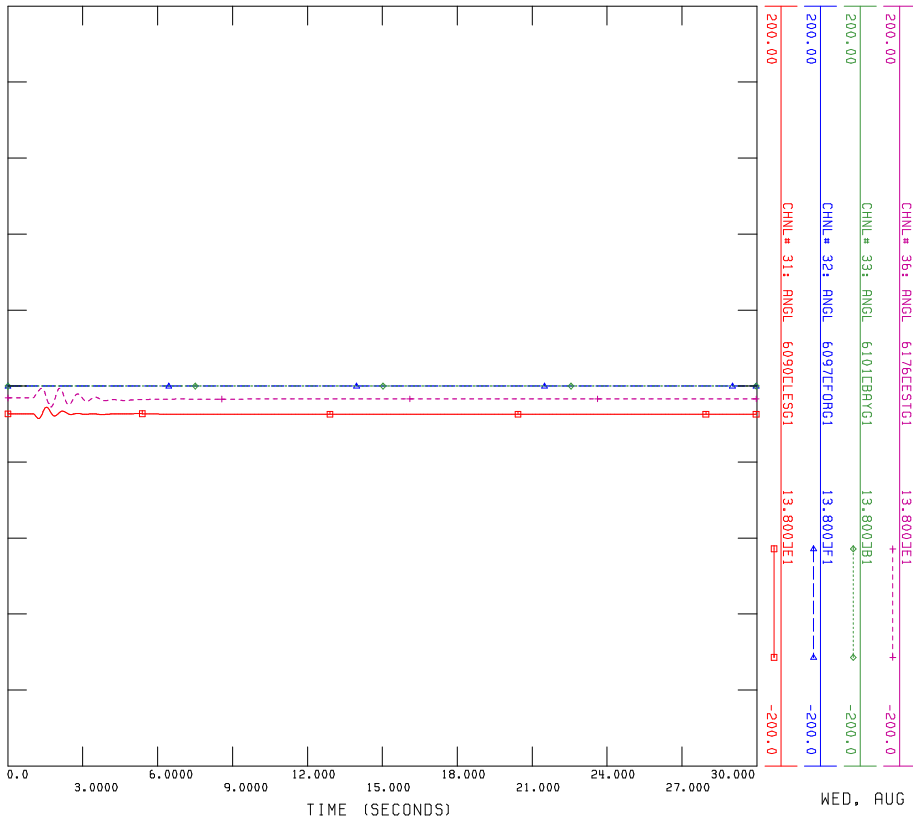
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 ANGULOS RELATIVOS EN MAGNITUDES TERMICAS.





ESCENARIO 2020CA-MODMAX-SEC - FALLA P006 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

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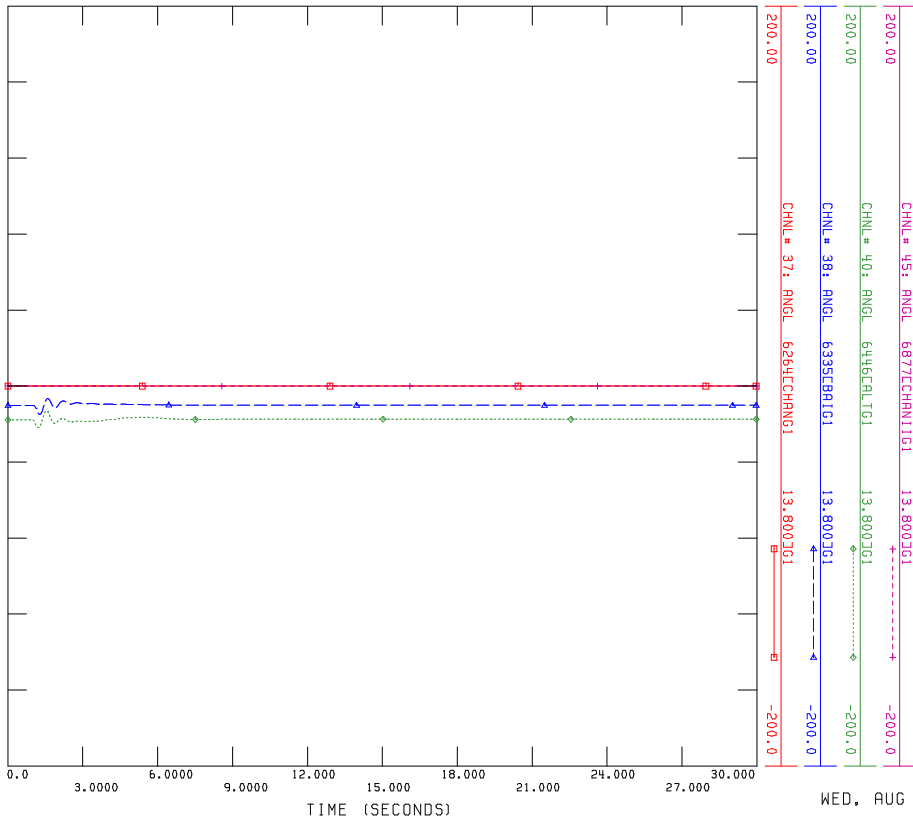


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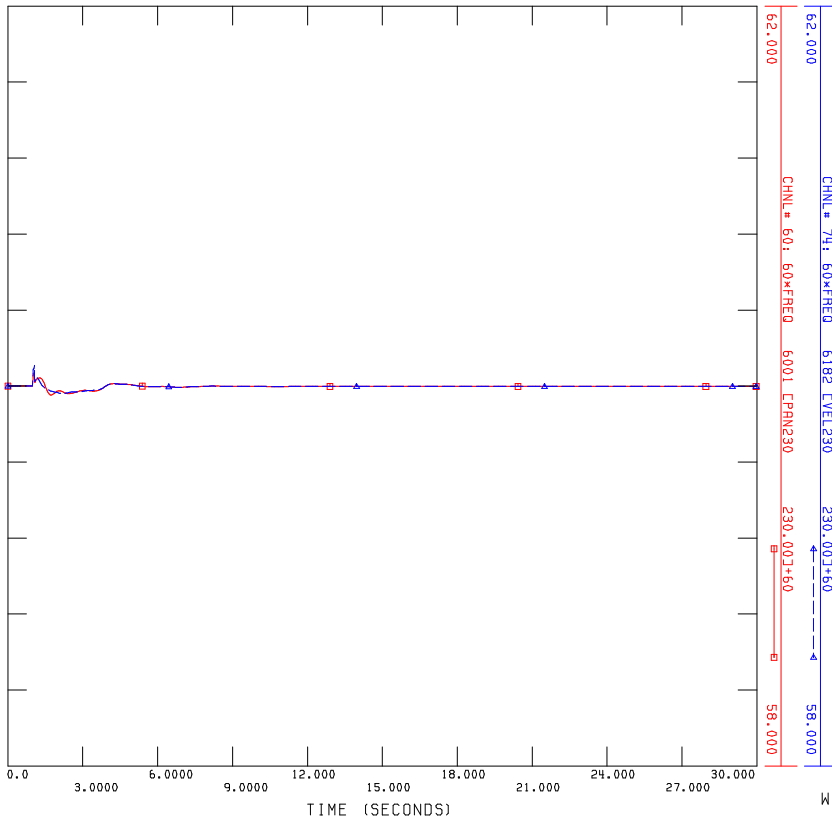




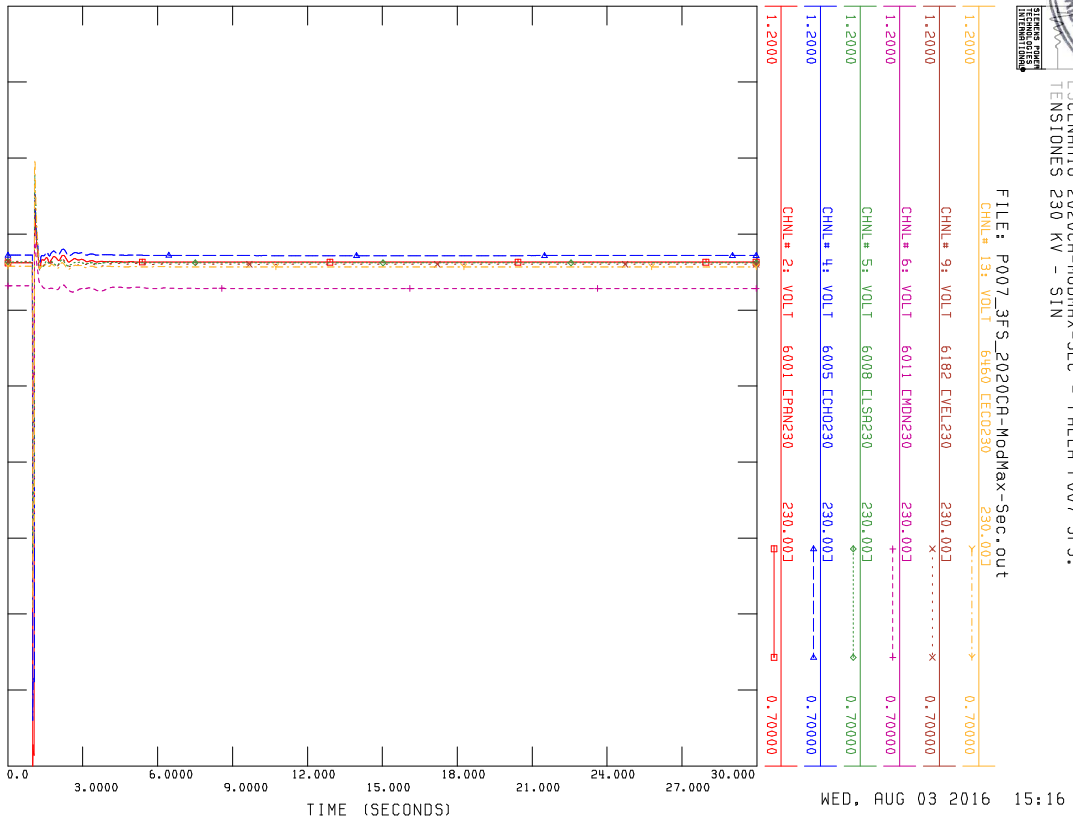


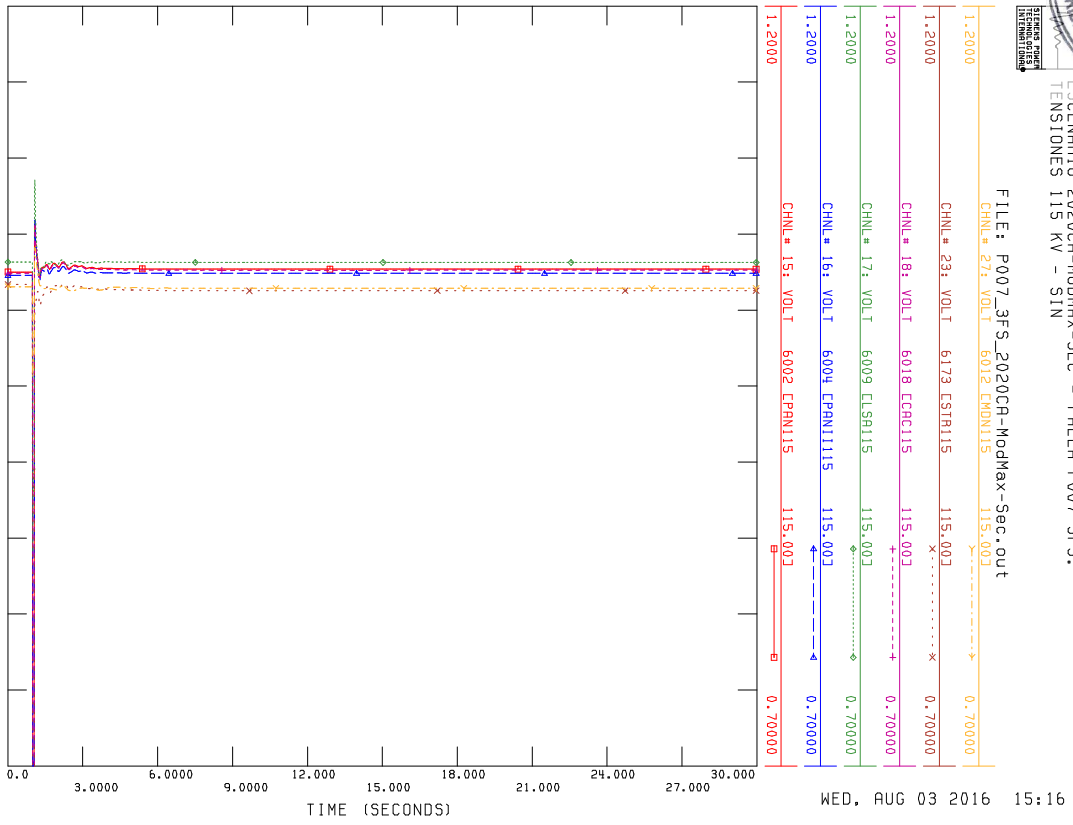
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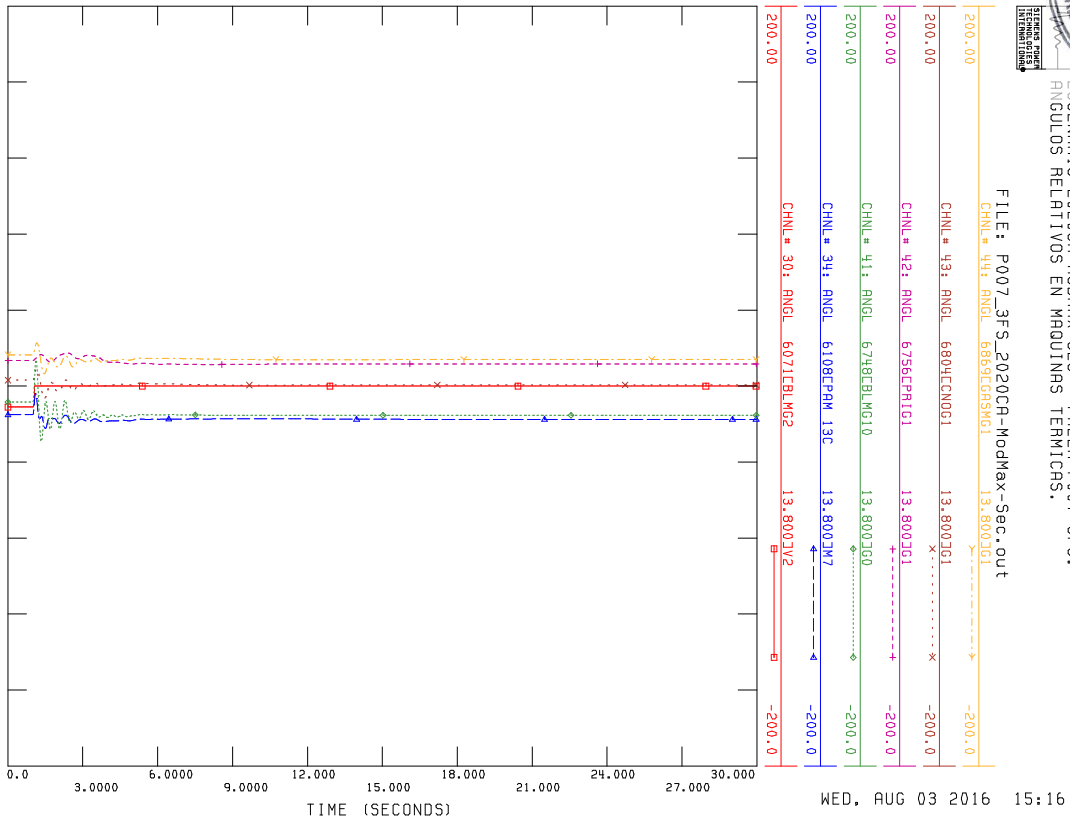
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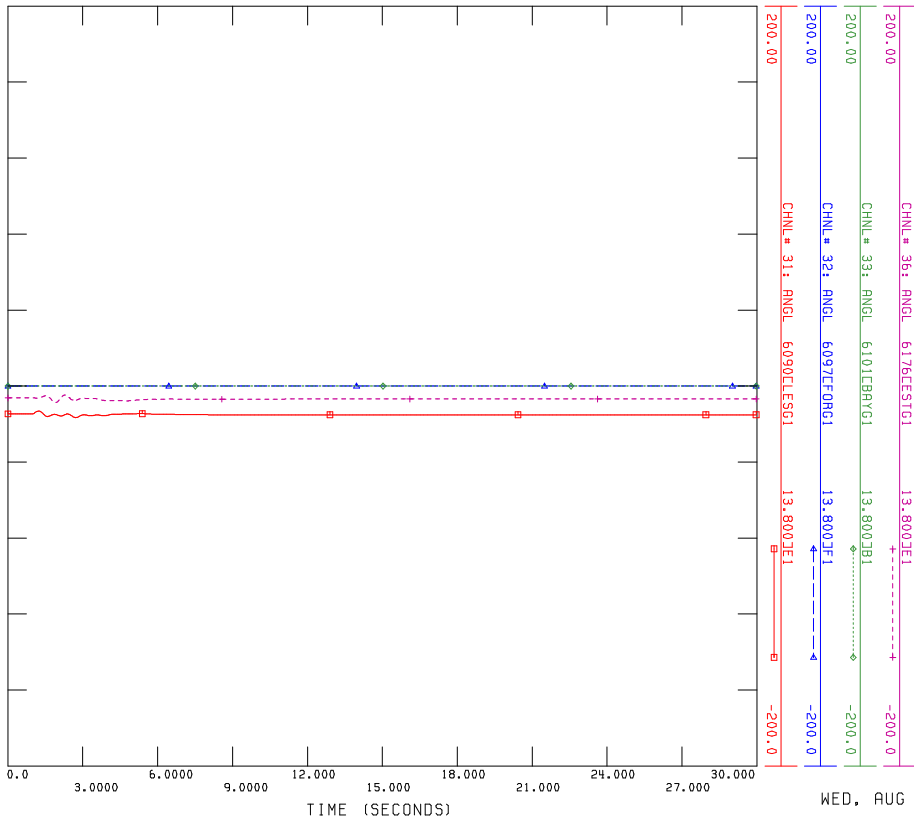






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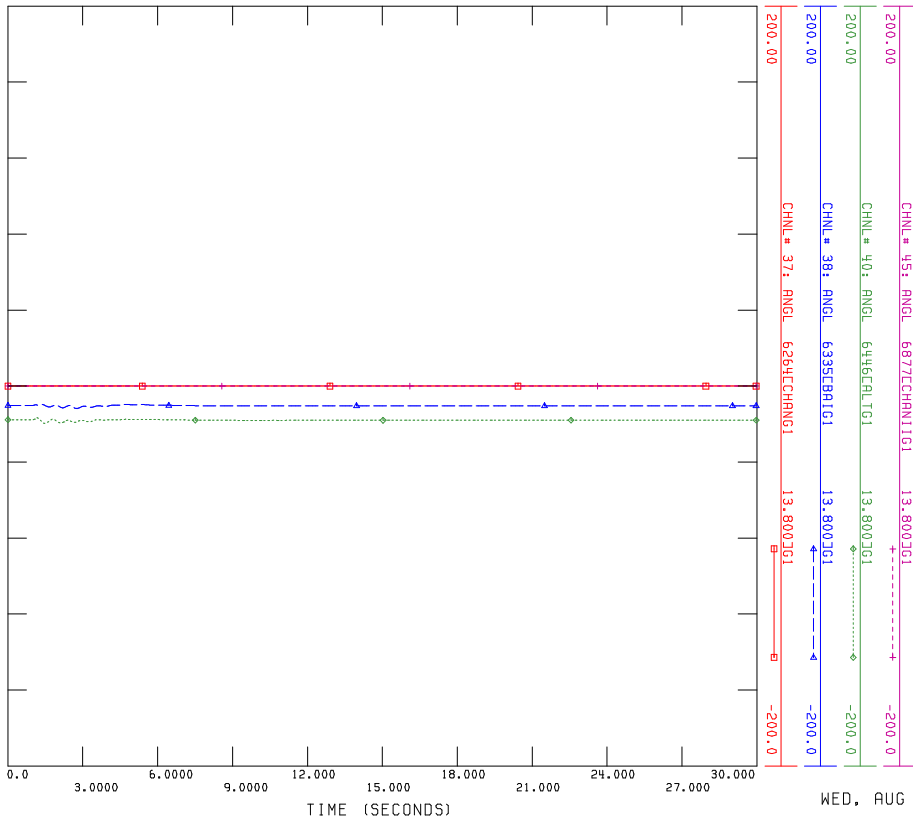


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P007 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

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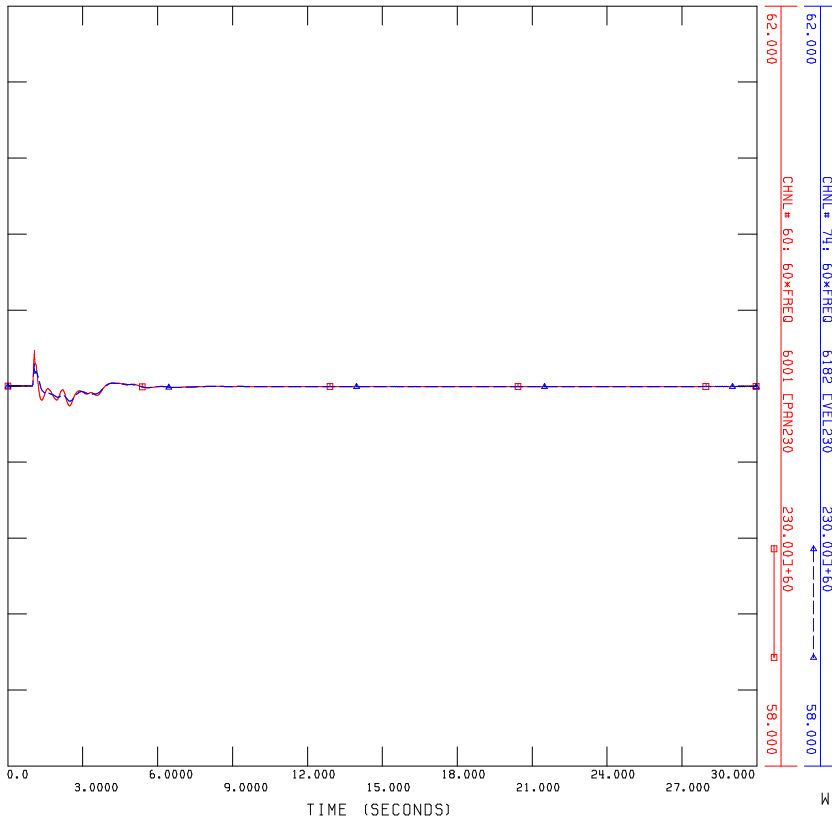


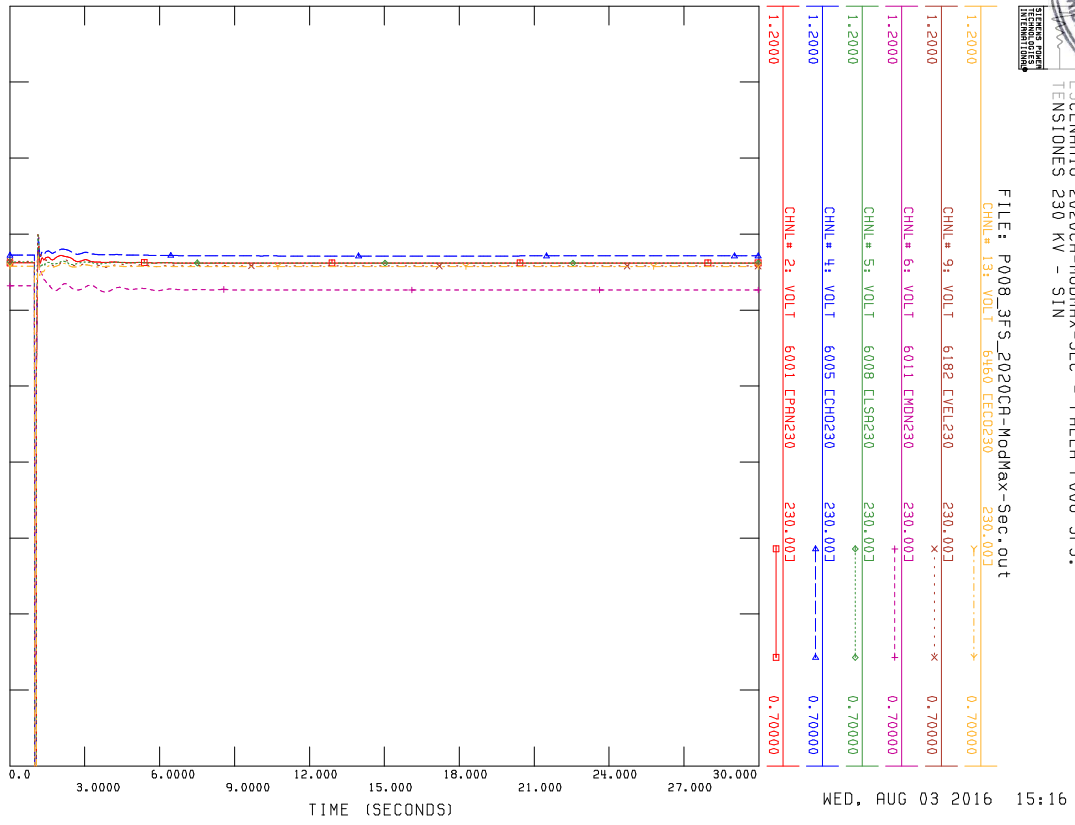
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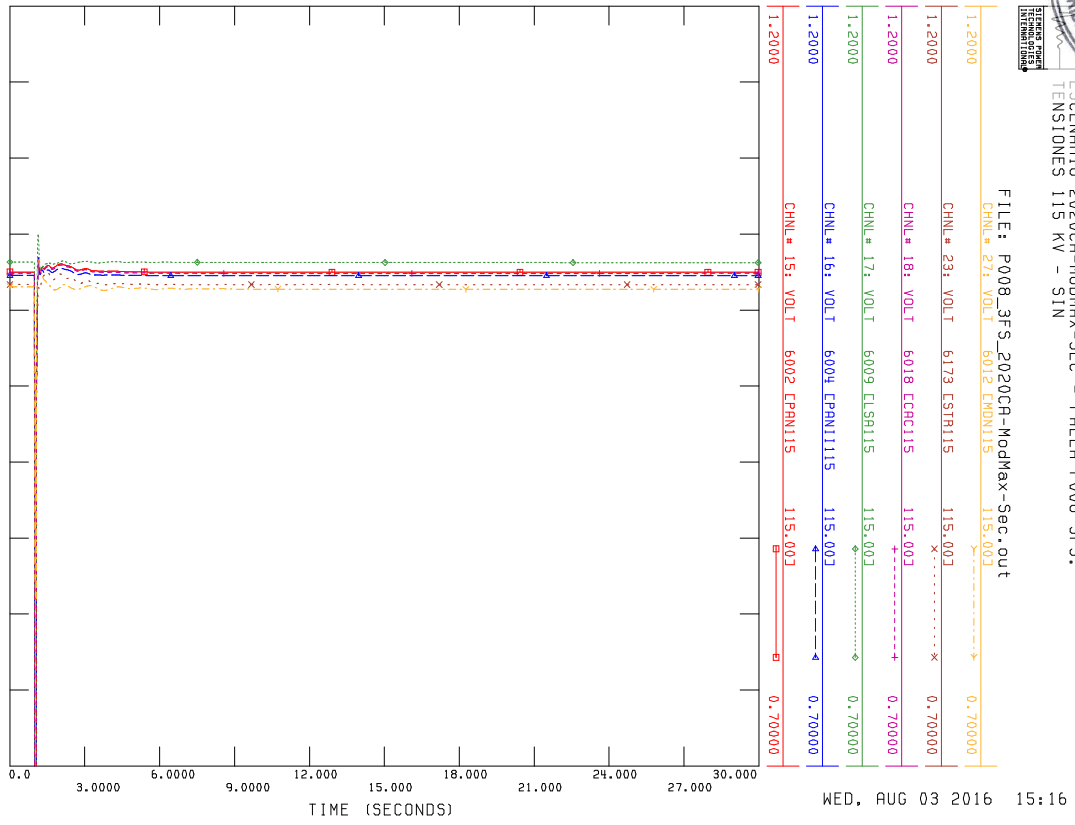
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FRECUENCIAS.

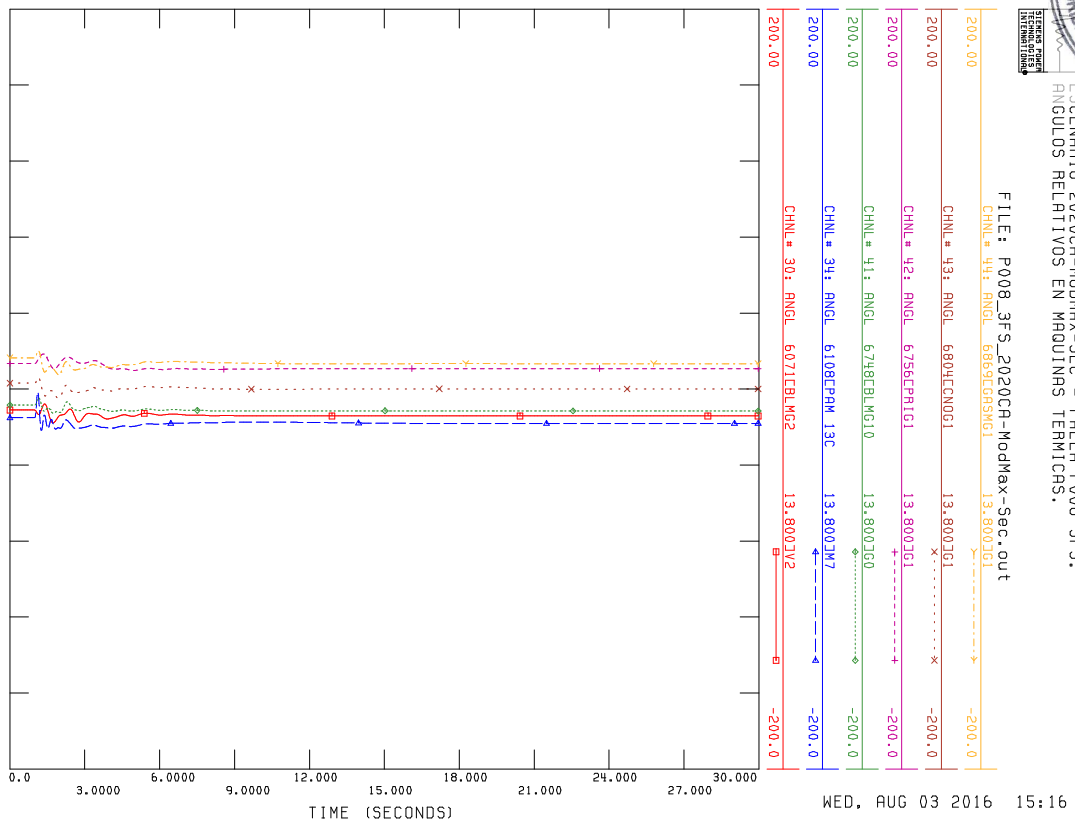
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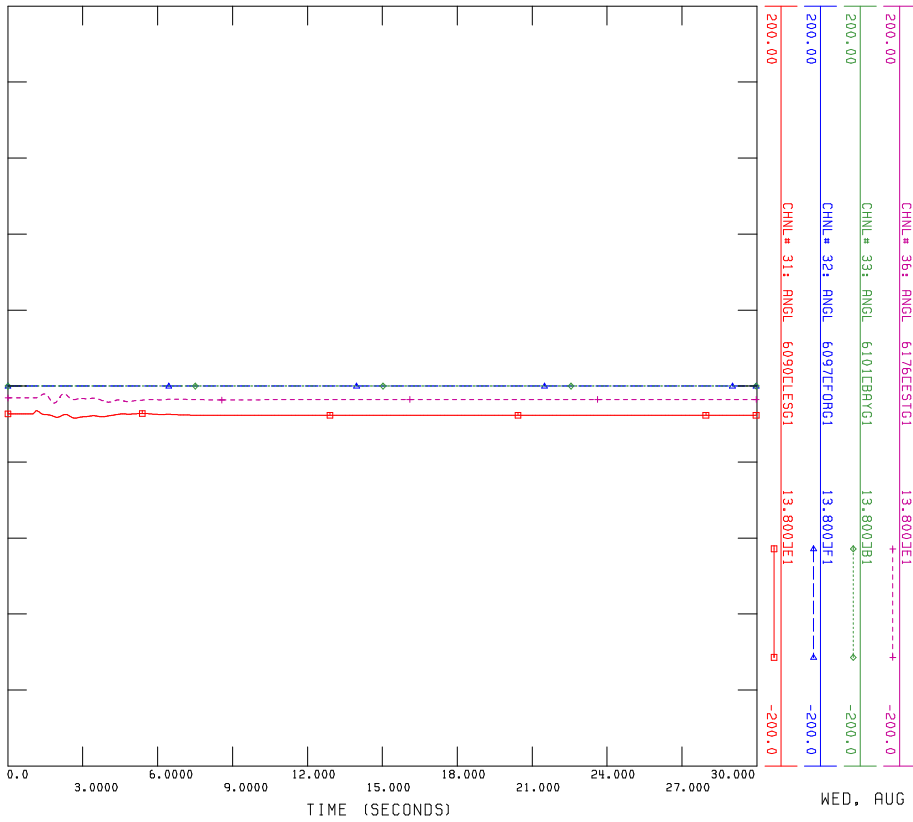






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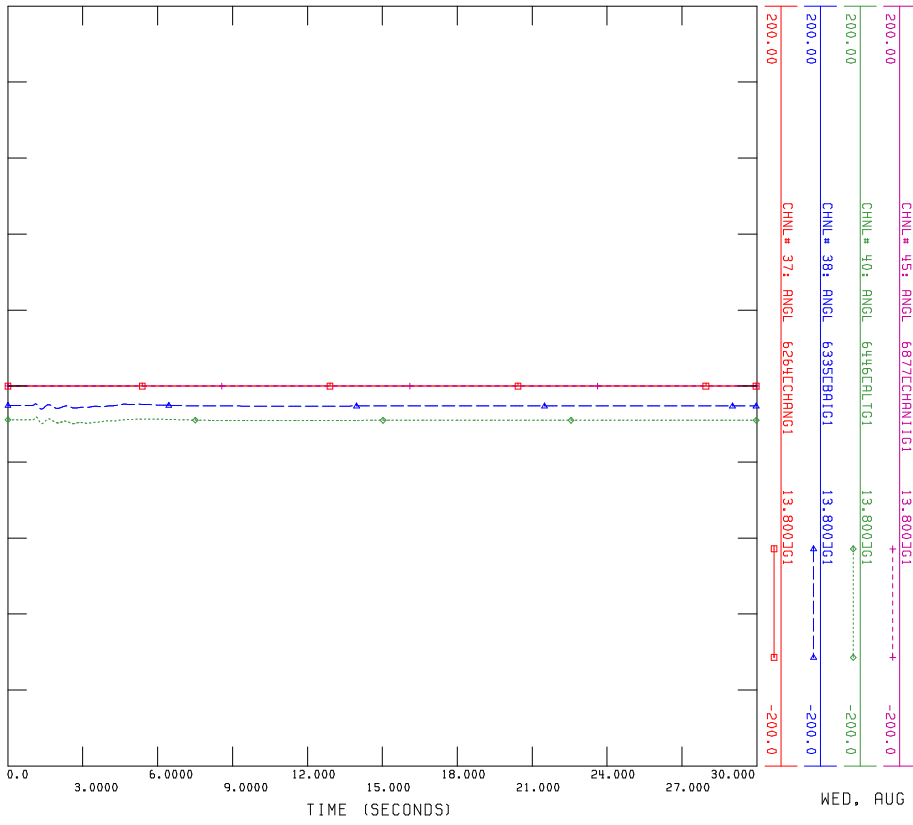


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 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

FILE: P008\_3FS\_2020CA-ModMax-Sec.out



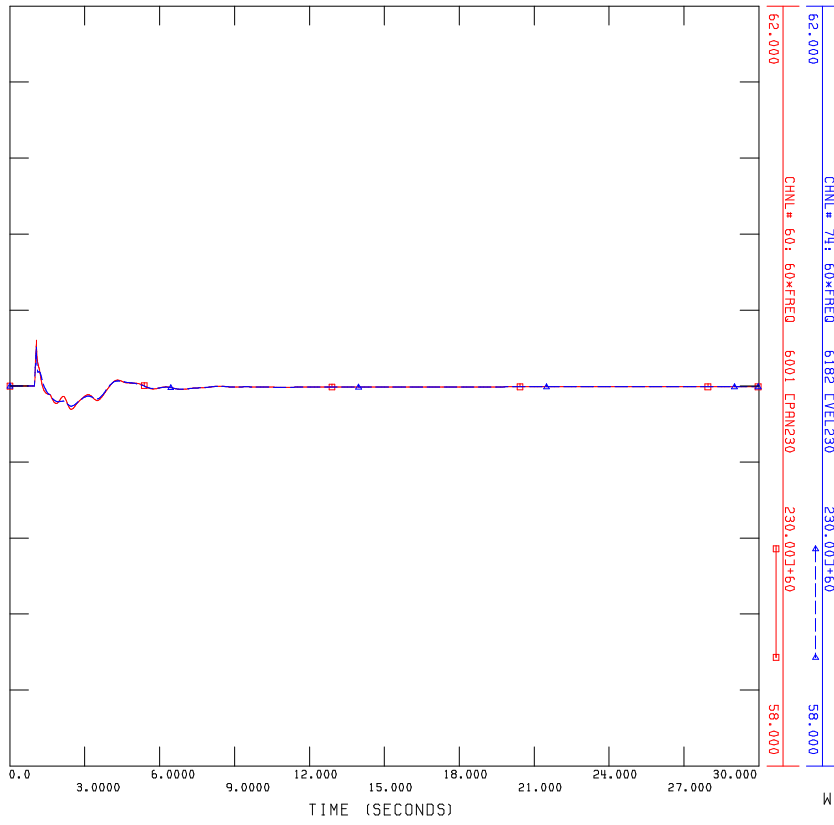
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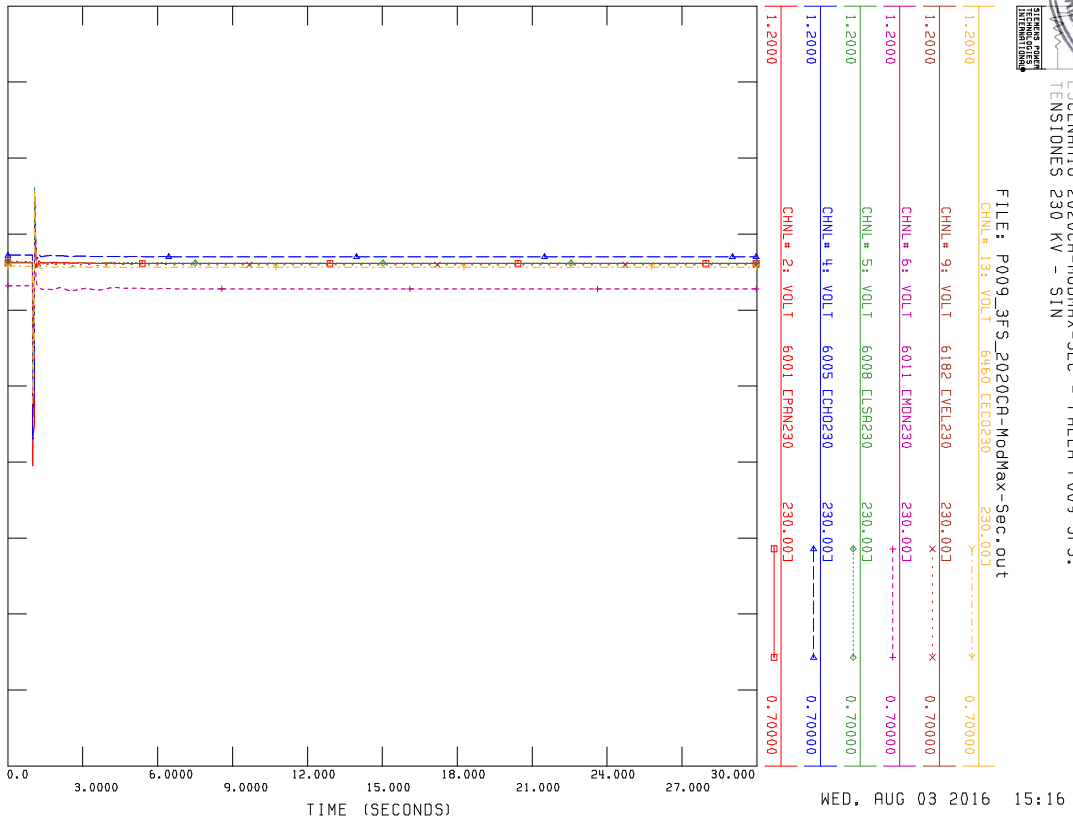
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DE MONITOREO

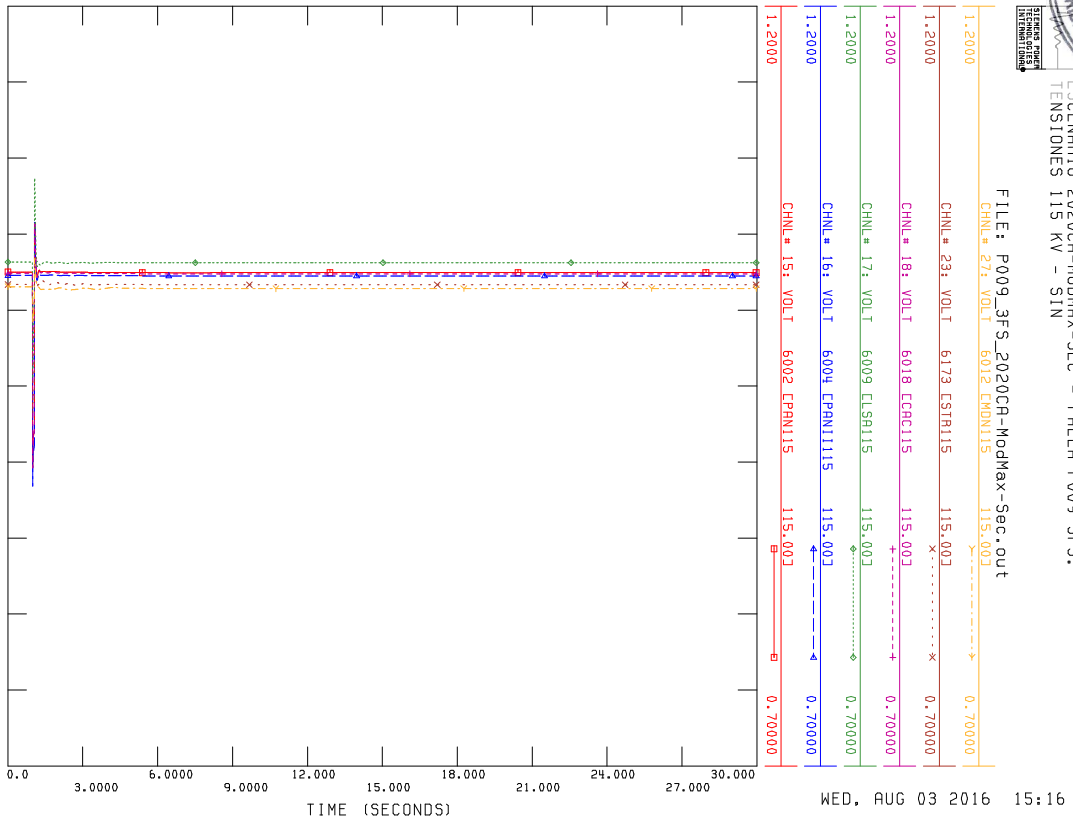
ESCENARIO 2020CA-MODMAX-SEC - FALLA P008 3FS.  
FRECUENCIAS.

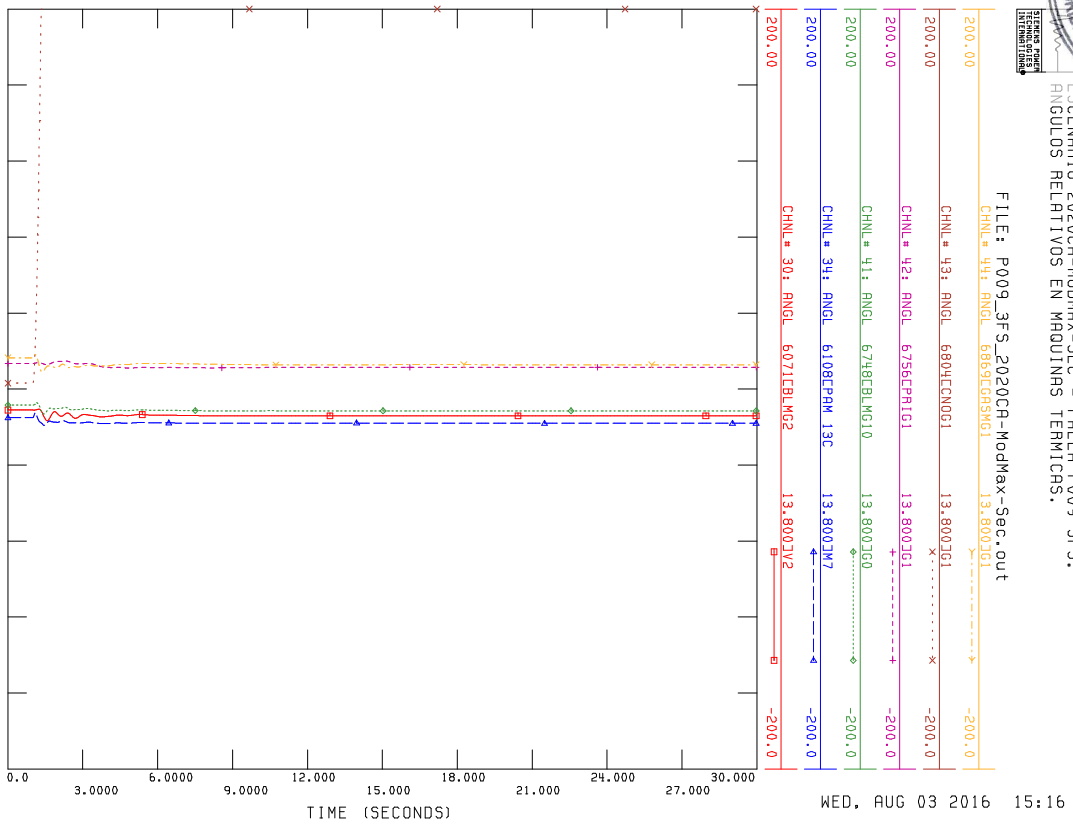
FILE: P008\_3FS\_2020CA-ModMax-Sec.out



WED, AUG 03 2016 15:16





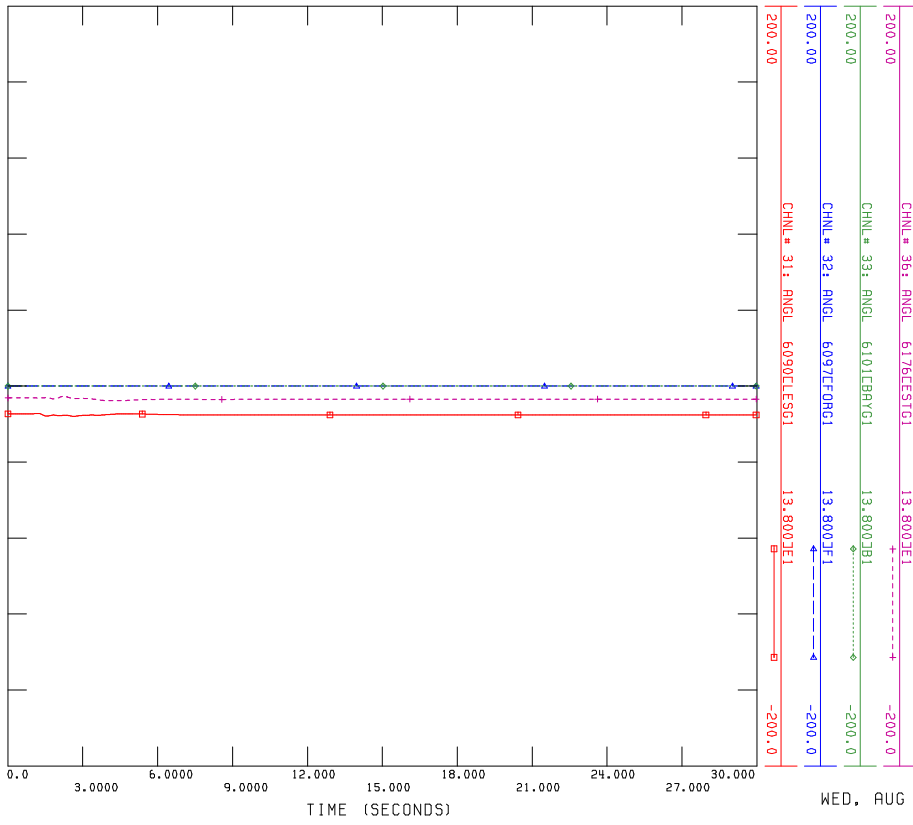






ESCENARIO 2020CA-MODMAX-SEC - FALLA P009 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

FILE: P009\_3FS\_2020CA-ModMax-Sec.out

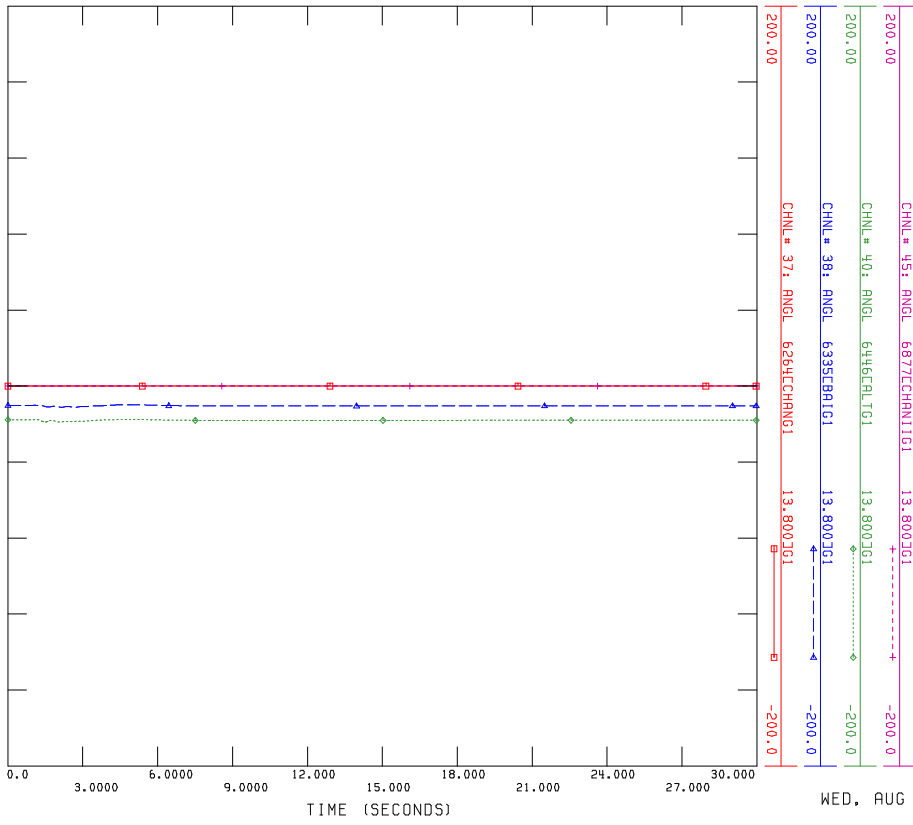


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P009 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

FILE: P009\_3FS\_2020CA-ModMax-Sec.out



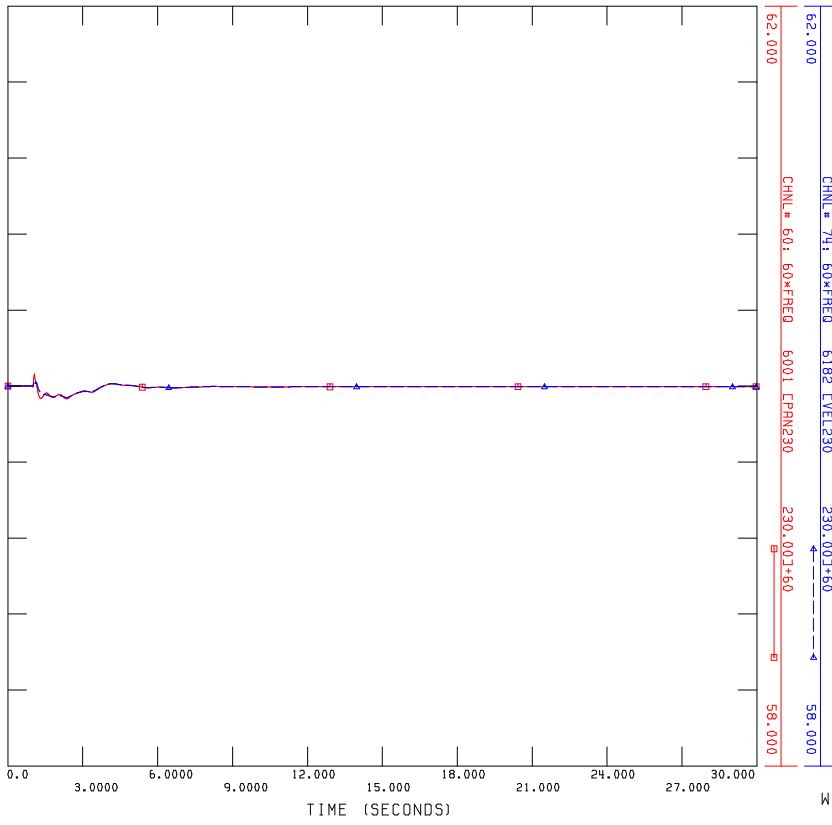
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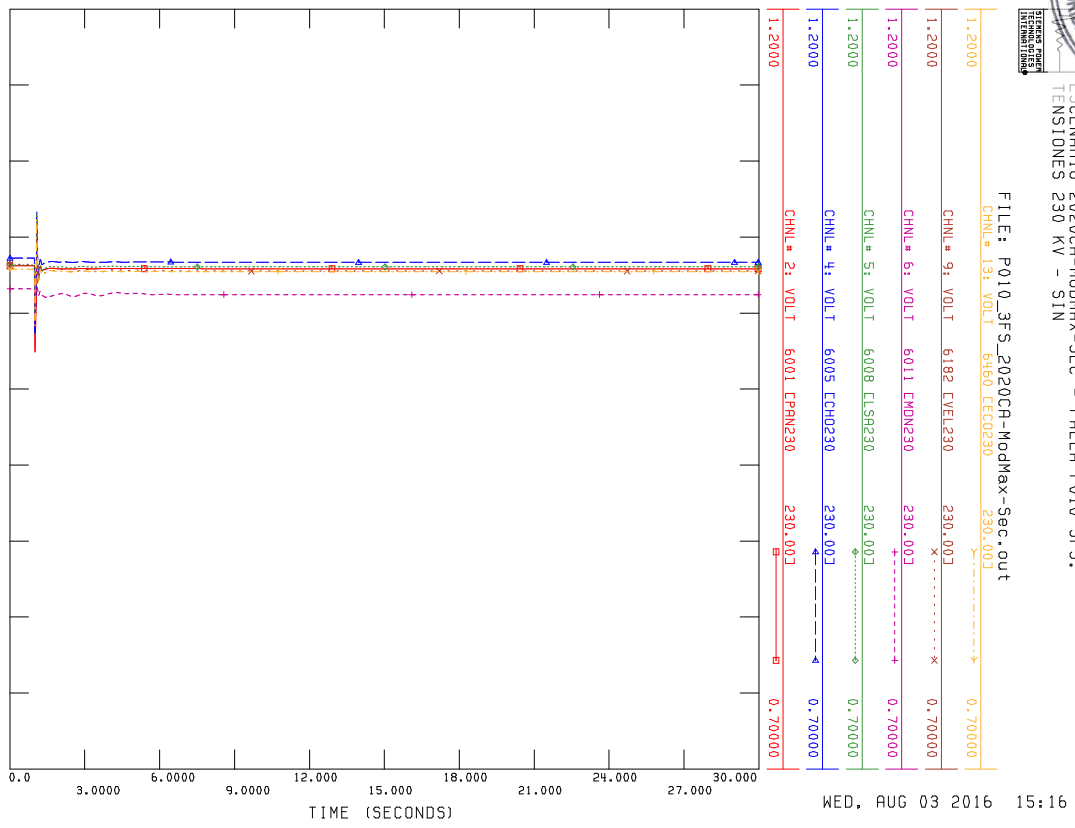
ESTACION  
 1009-3FS

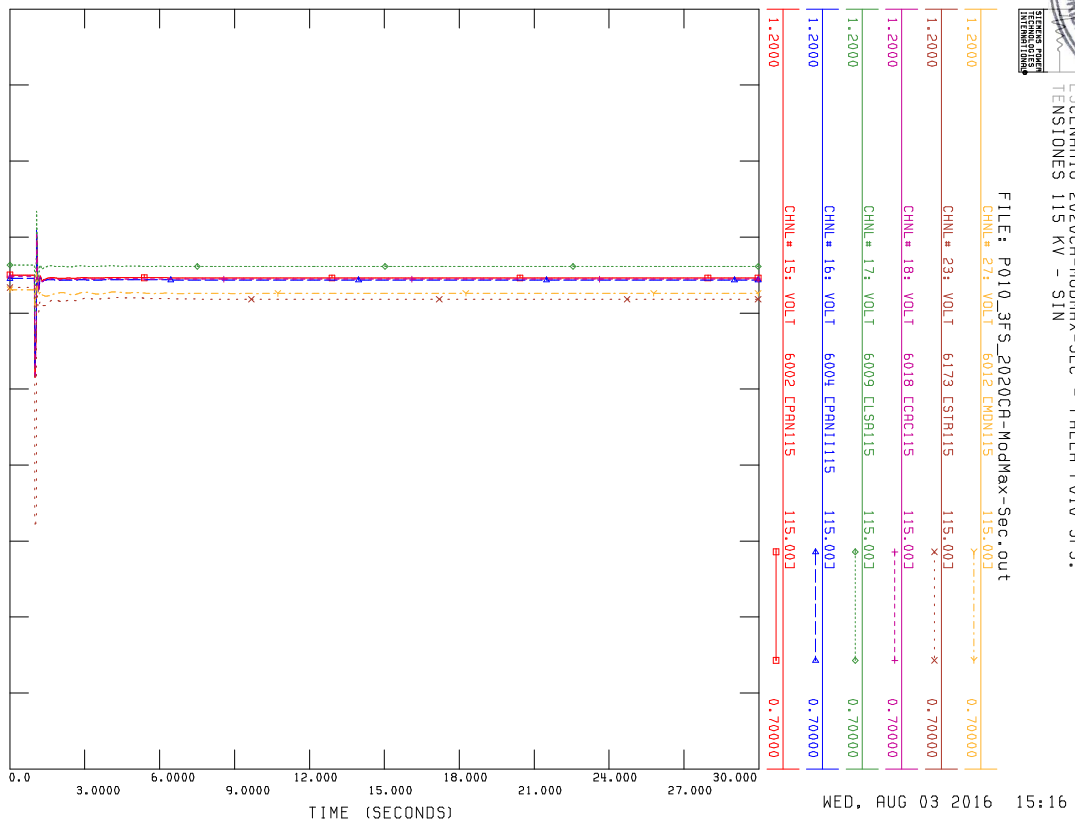
ESCENARIO 2020CA-MODMAX-SEC - FULLR P009 3FS.  
 FRECUENCIAS.

FILE: P009\_3FS\_2020CA-ModMax-Sec.out



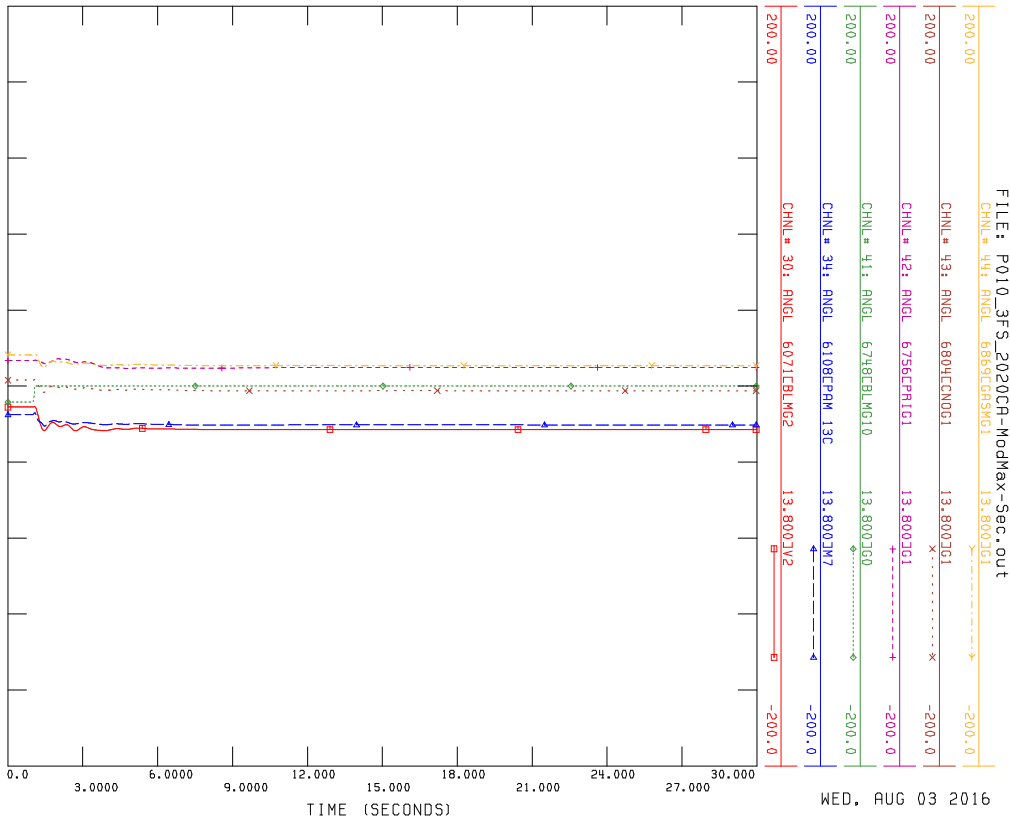
WED, AUG 03 2016 15:16







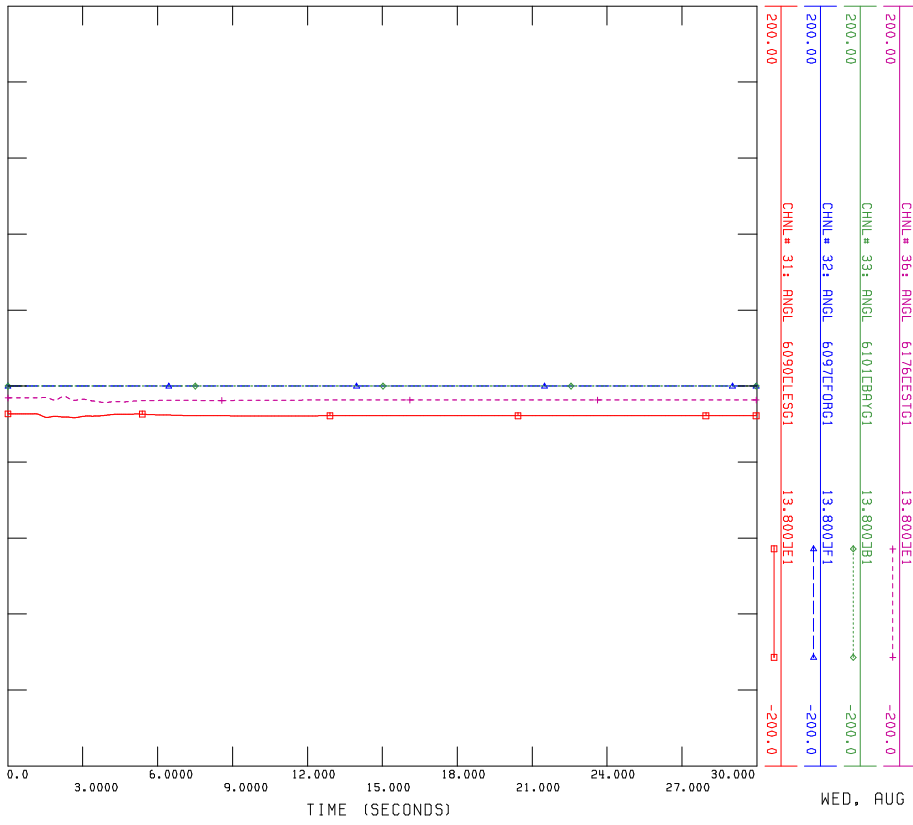
ESCENARIO 2020CA-MODMAX-SEC - FALLA P010 3FS.  
 ANGULOS RELATIVOS EN MAGNINS TERMICAS.





ESCENARIO 2020CA-MODMAX-SEC - FALLA P010 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICHS.

FILE: P010\_3FS\_2020CA-ModMax-Sec.out

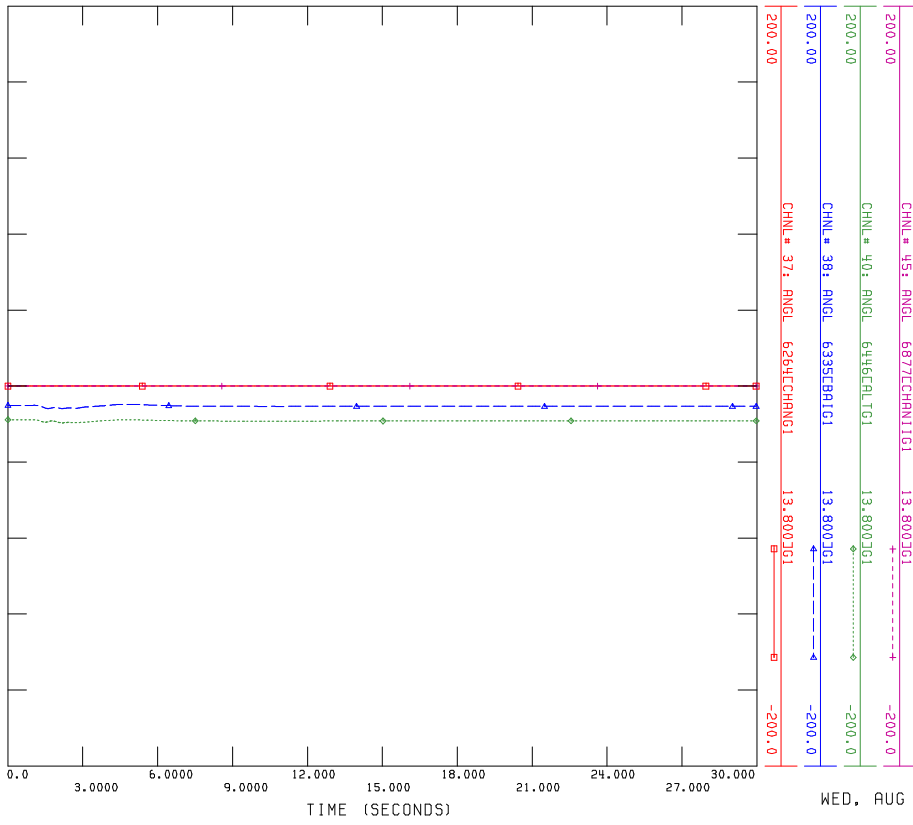


WED, AUG 03 2016 15:16



ESCENARIO 2020CA-MODMAX-SEC - FALLA P010 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

FILE: P010\_3FS\_2020CA-ModMax-Sec.out



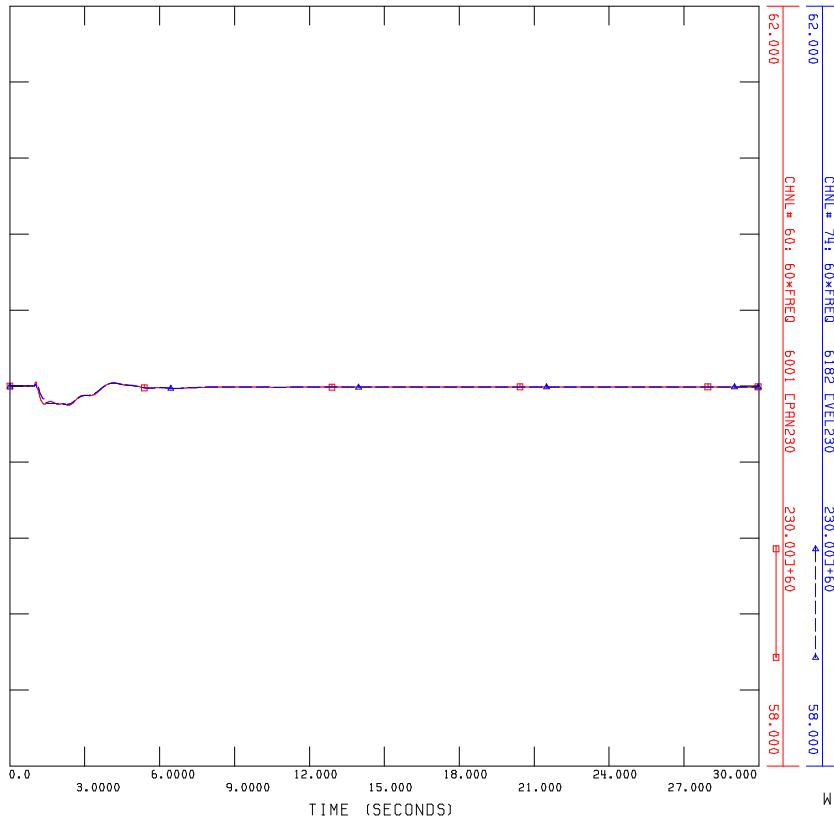
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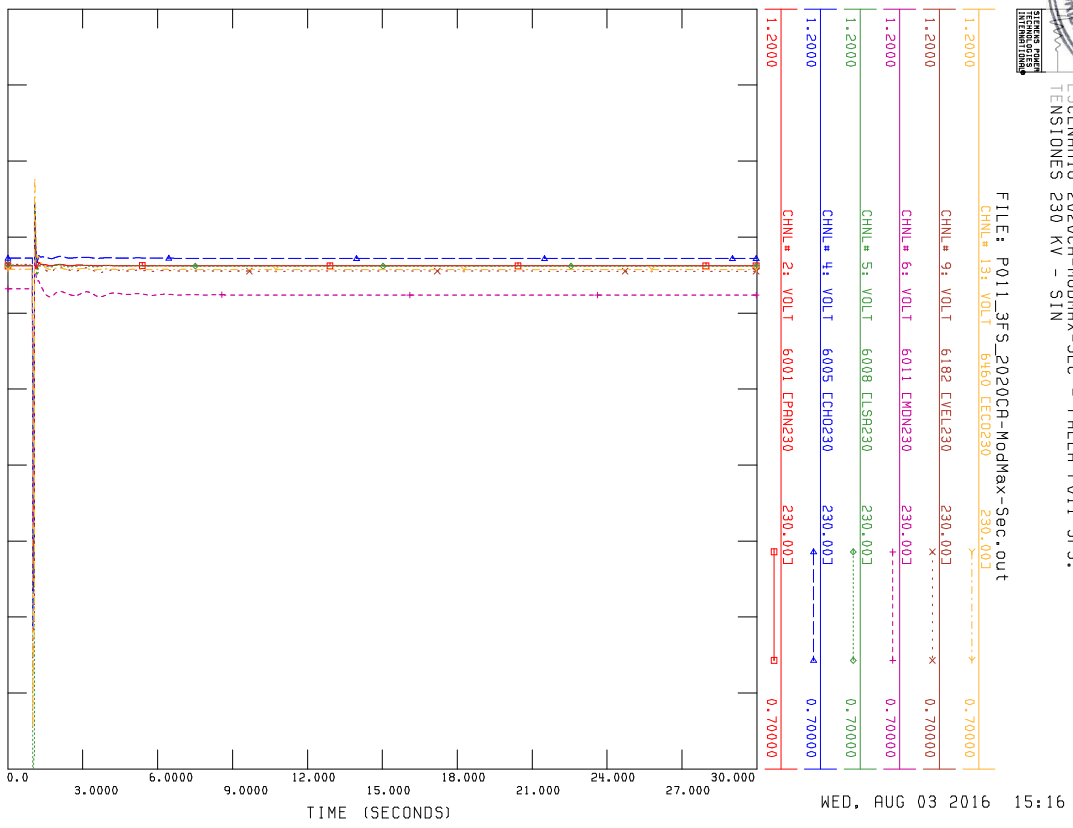


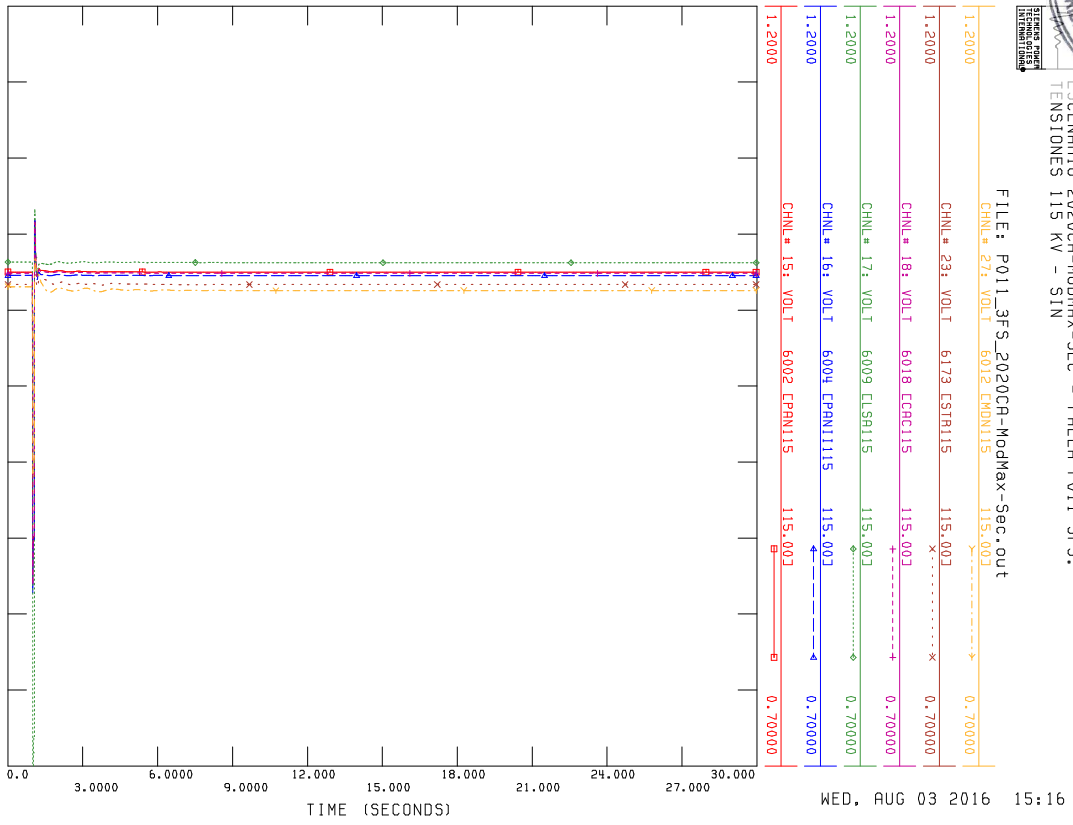
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FRECUENCIAS.

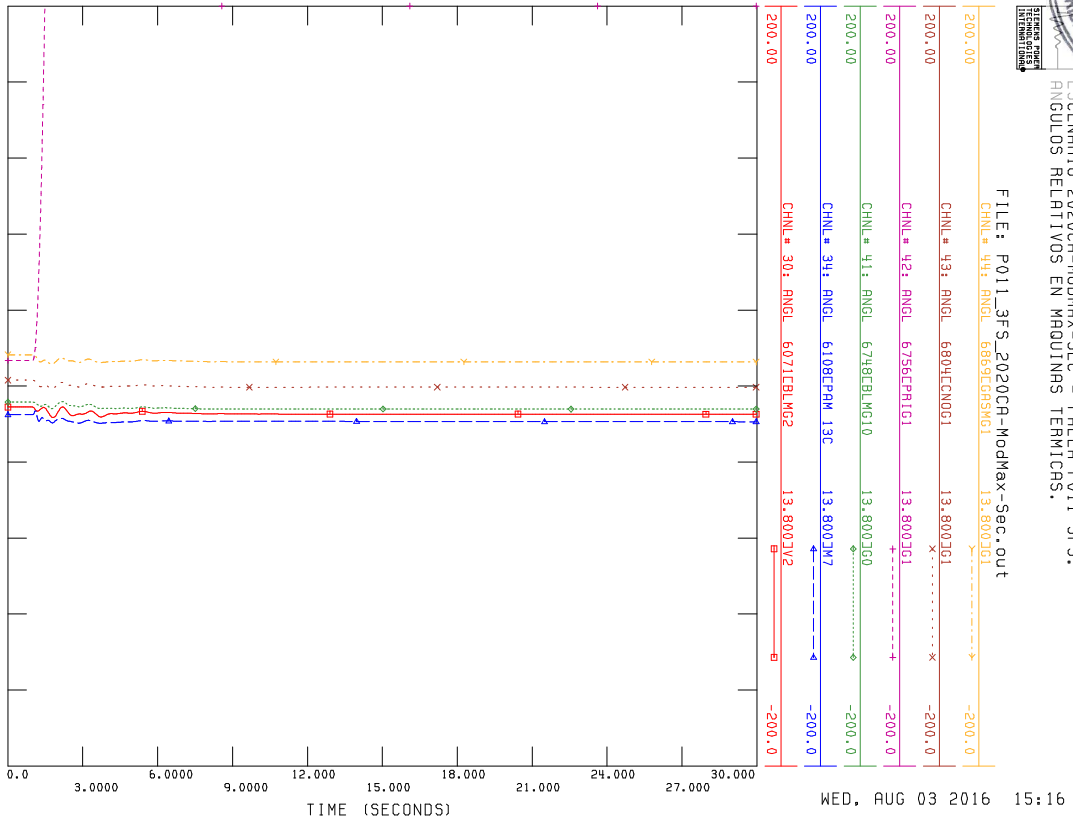
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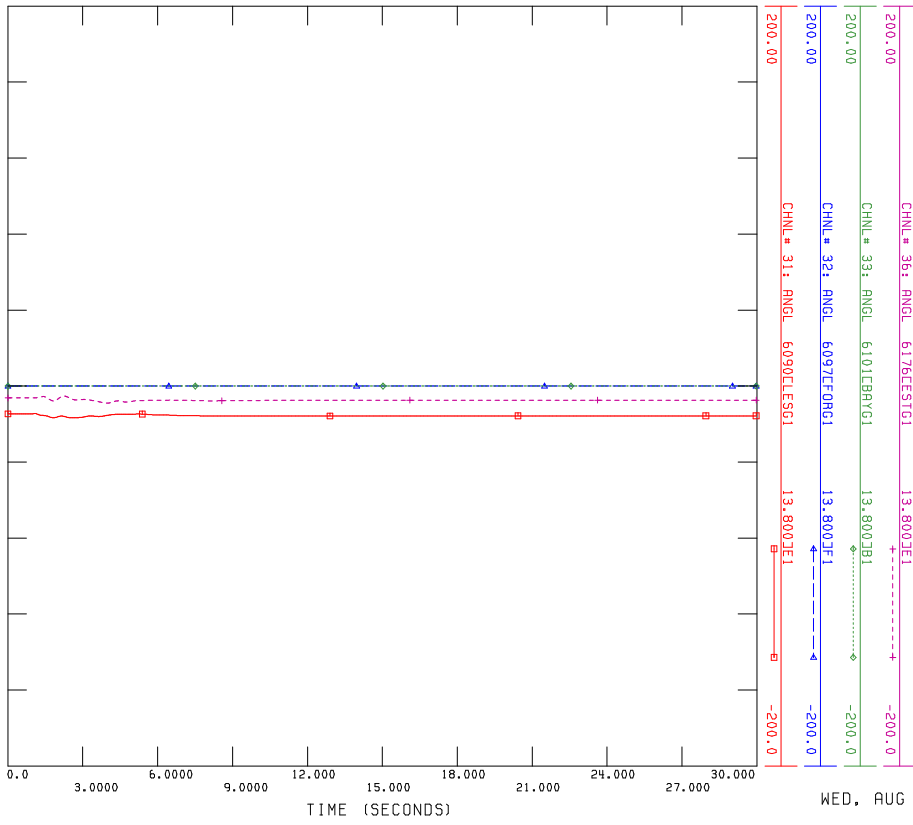






ESCENARIO 2020CA-MODMAX-SEC - FALLA P011 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

FILE: P011\_3FS\_2020CA-ModMax-Sec.out

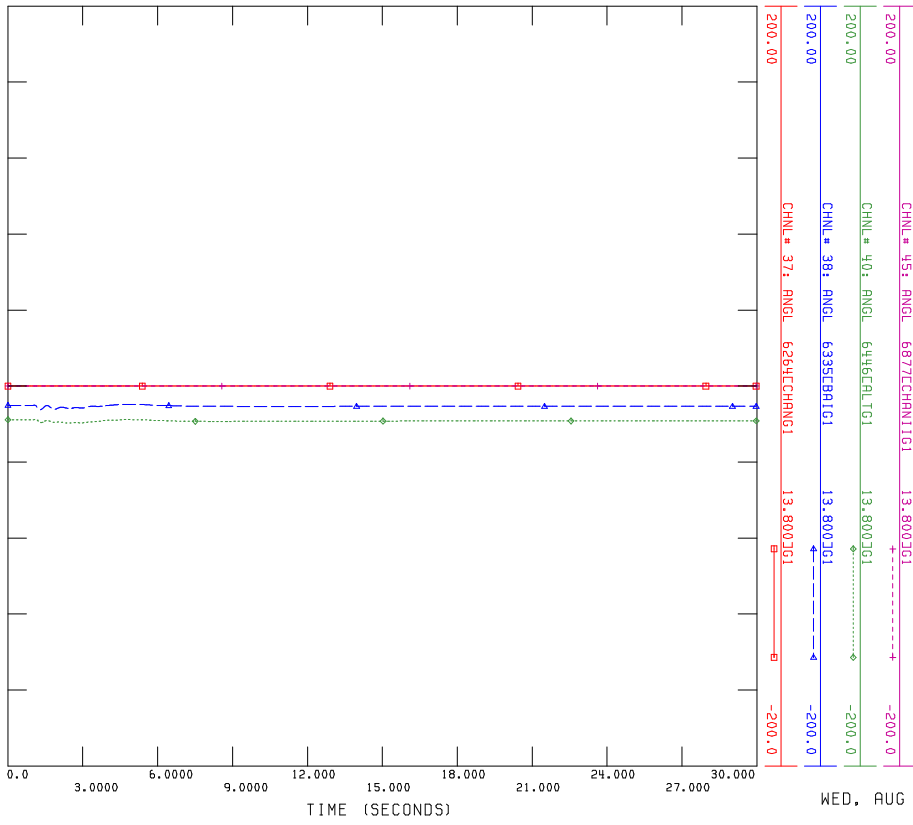


WED, AUG 03 2016 15:16



ESCENARIO 2020CA-MODMAX-SEC - FALLA P011 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

FILE: P011\_3FS\_2020CA-ModMax-Sec.out



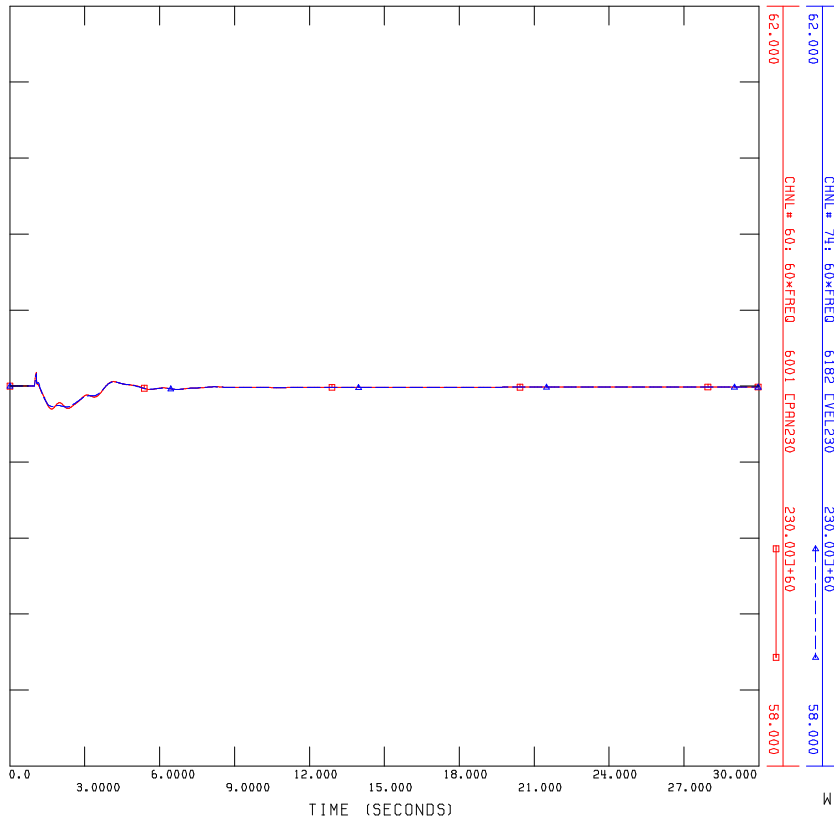
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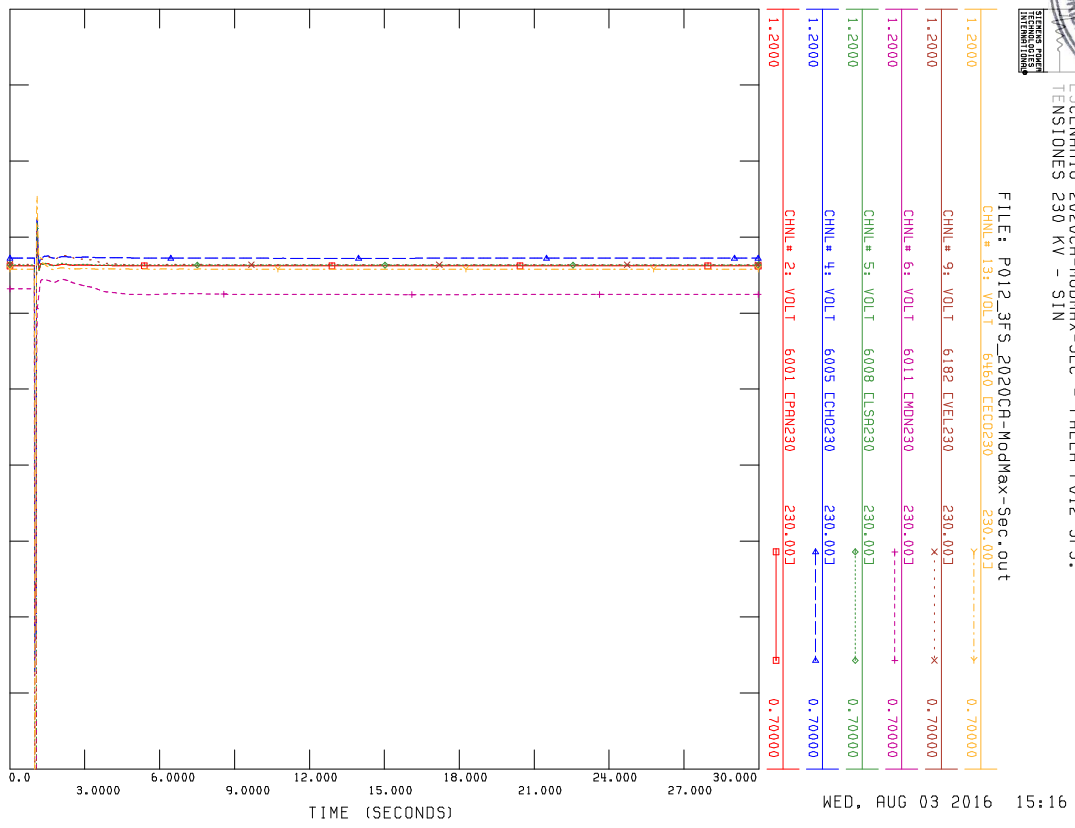
ESTACION  
DE MONITOREO

ESCENARIO 2020CA-MODMAX-SEC - FALLA P011 3FS.  
FRECUENCIAS.

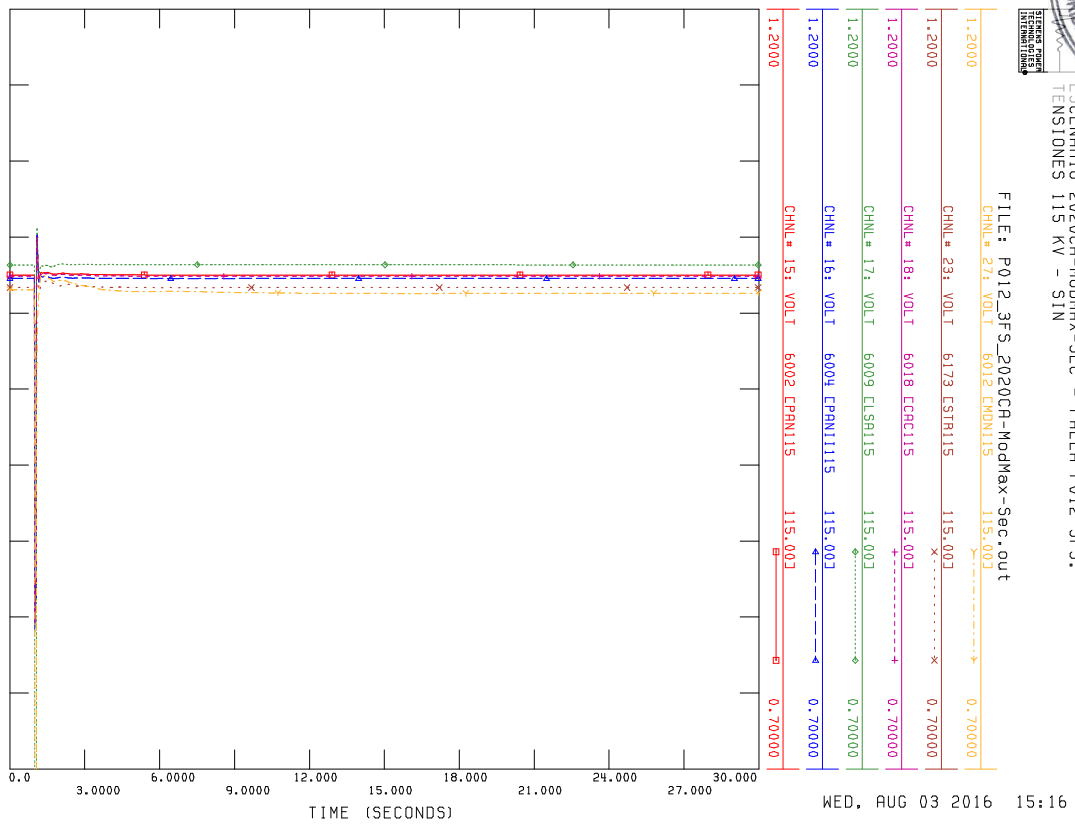
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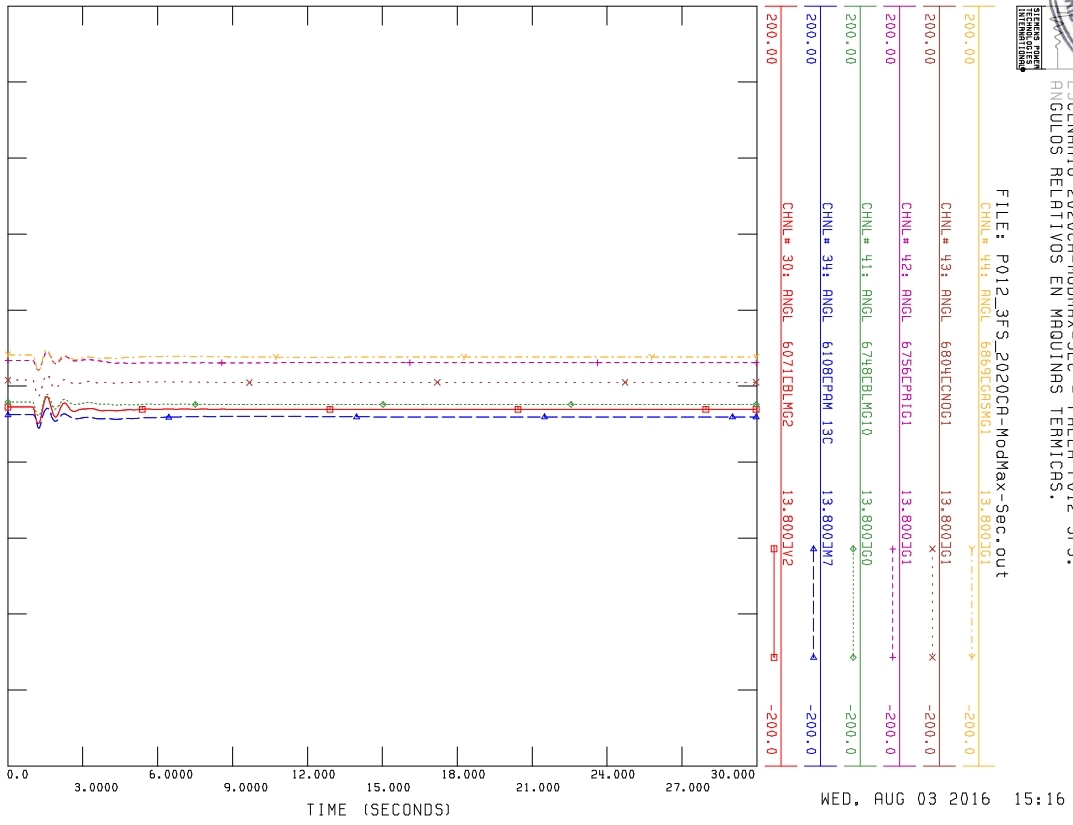


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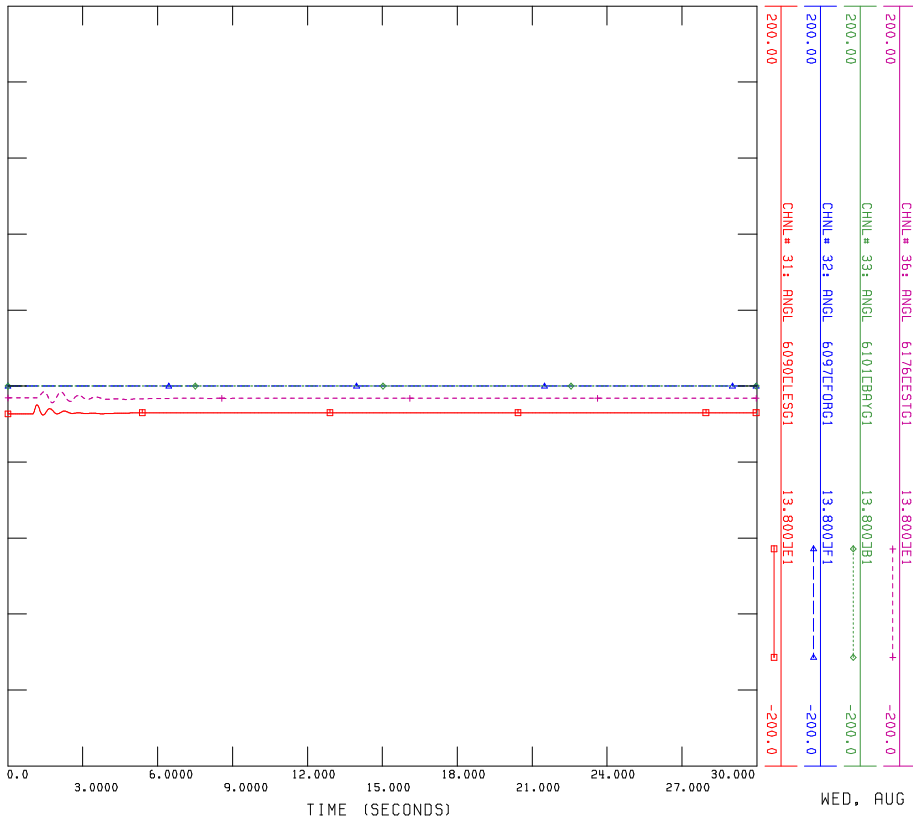






ESCENARIO 2020CA-MODMAX-SEC - FALLA P012 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

FILE: P012\_3FS\_2020CA-ModMax-Sec.out

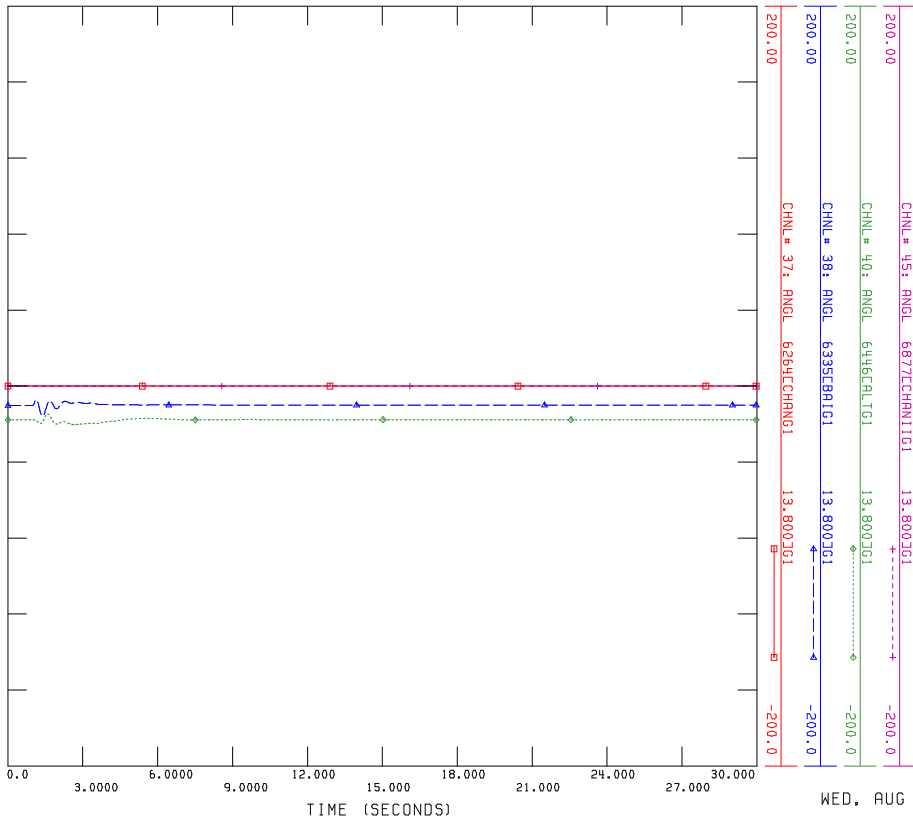


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P012 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

FILE: P012\_3FS\_2020CA-ModMax-Sec.out



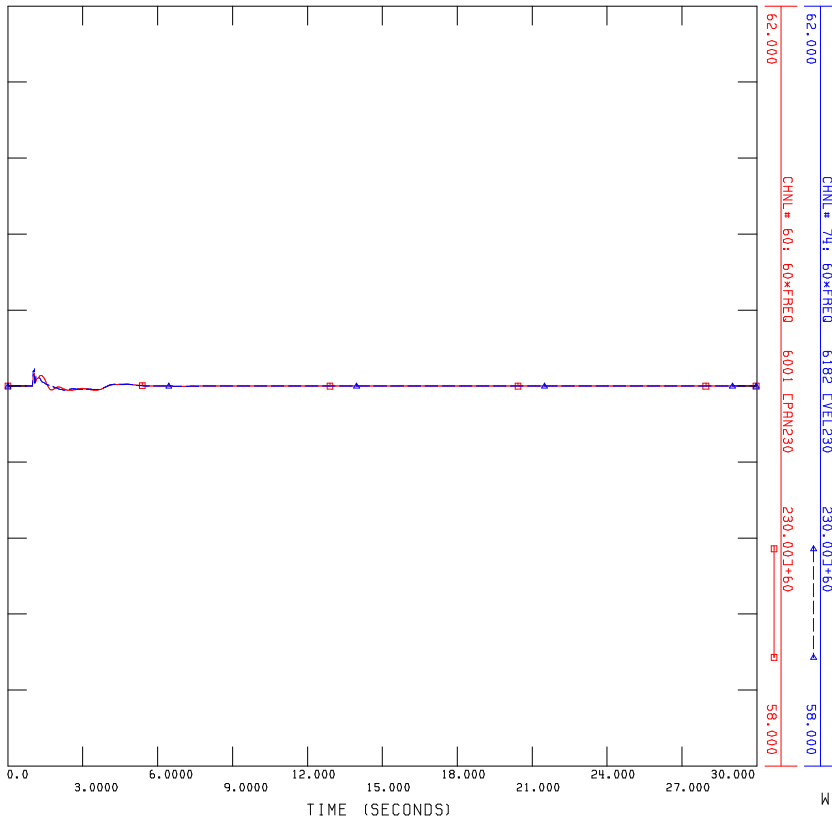
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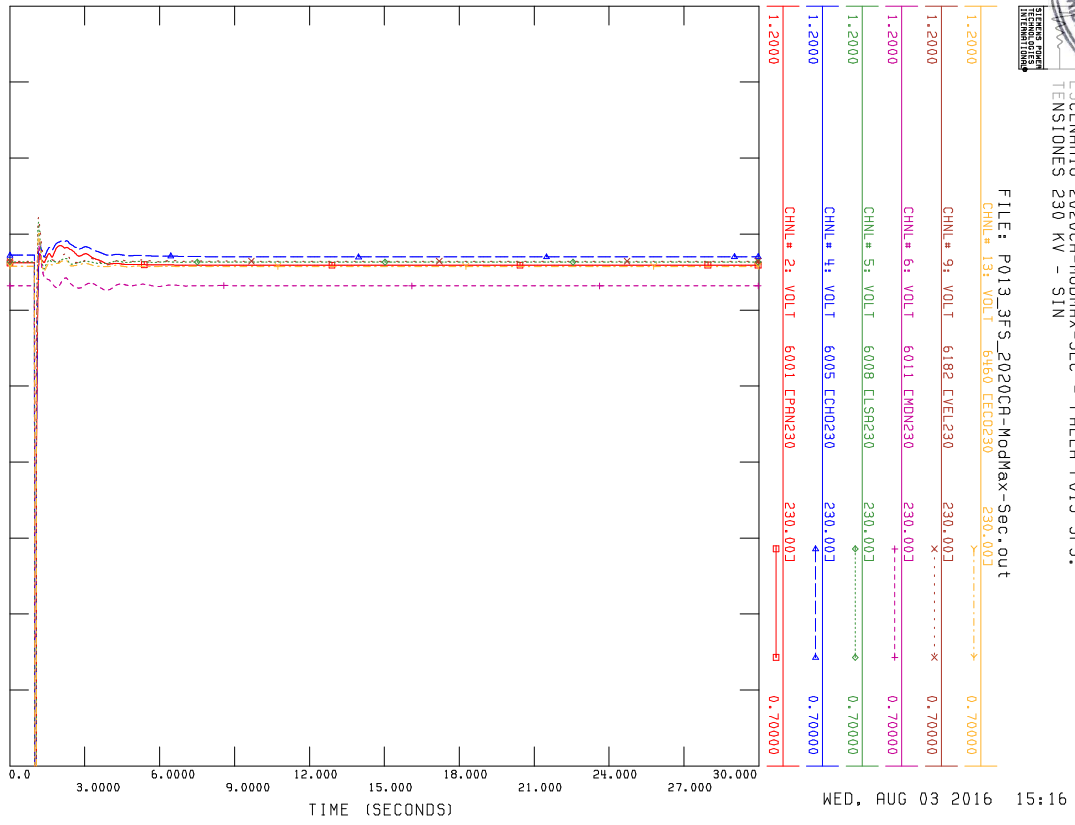
ESTACION  
DE MONITOREO

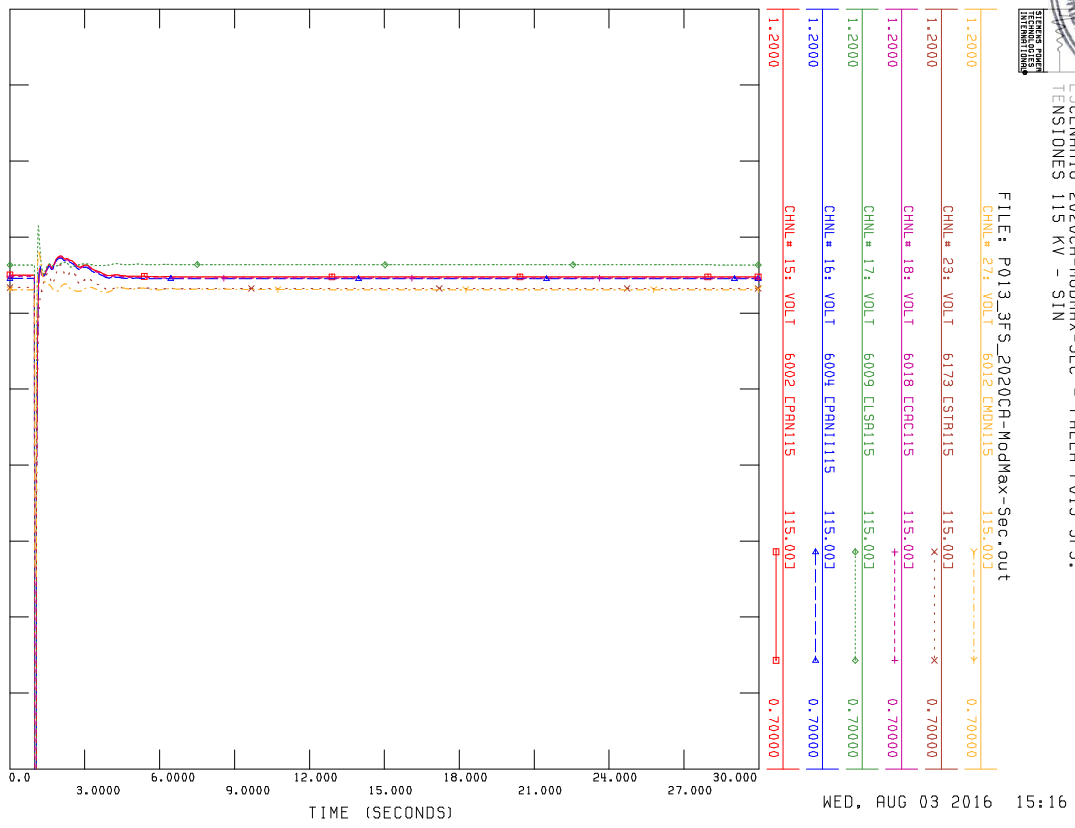
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FRECUENCIAS.

FILE: P012\_3FS\_2020CA-ModMax-Sec.out



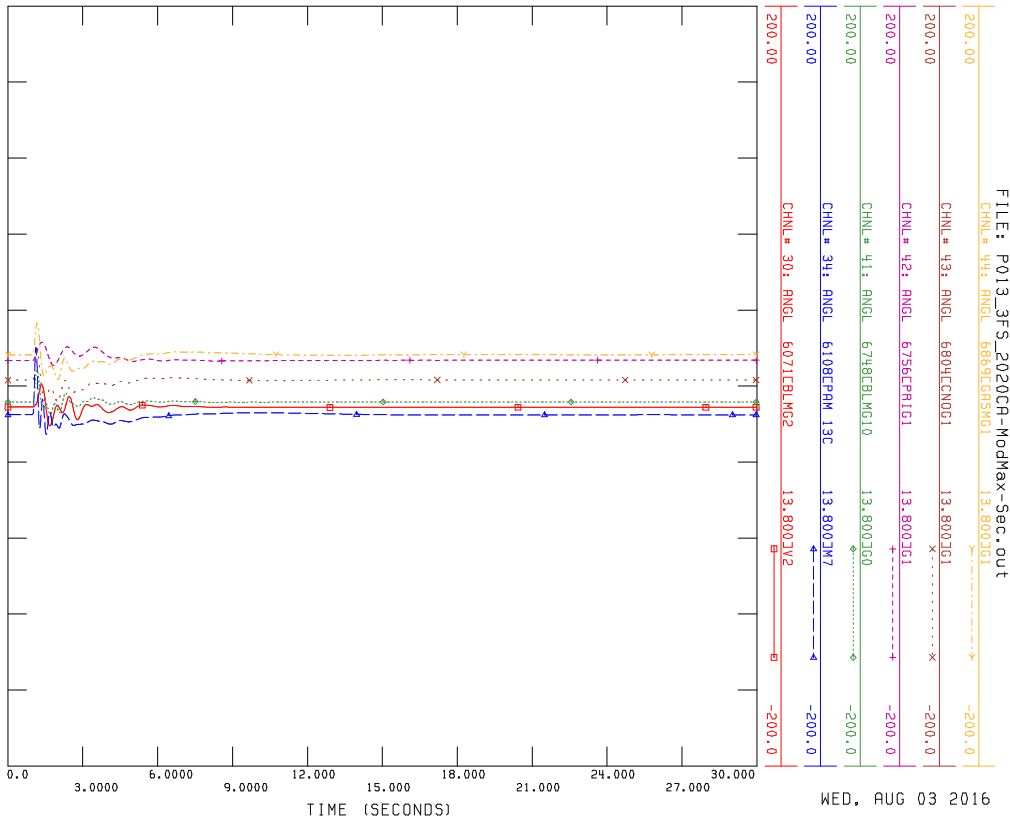
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ESCENARIO 2020CA-MODMAX-SEC - FALLA P013 3FS.  
 ANGULOS RELATIVOS EN MQUINNS TERMICAS.

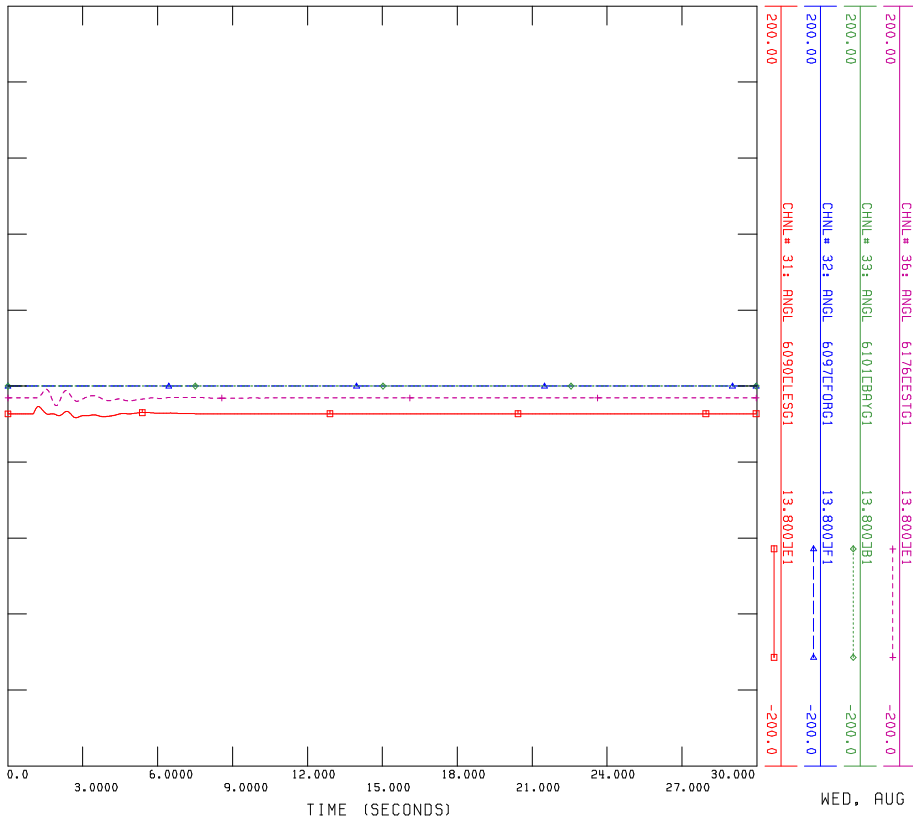






ESCENARIO 2020CA-MODMAX-SEC - FALLA P013 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

FILE: P013\_3FS\_2020CA-ModMax-Sec.out

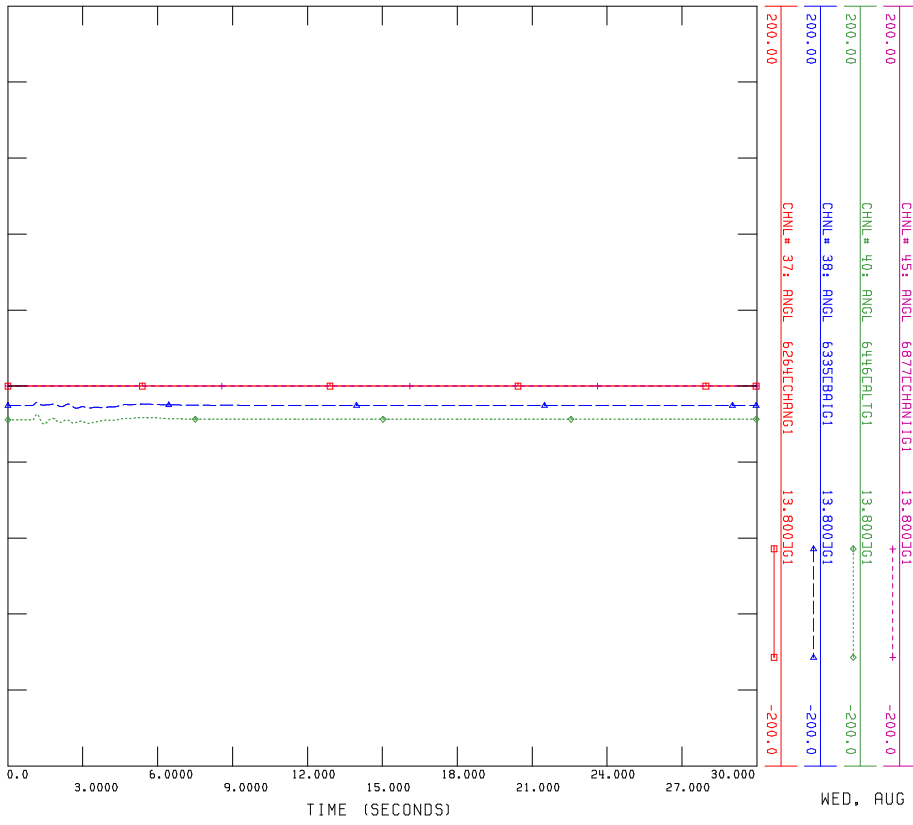


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P013 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

FILE: P013\_3FS\_2020CA-ModMax-Sec.out



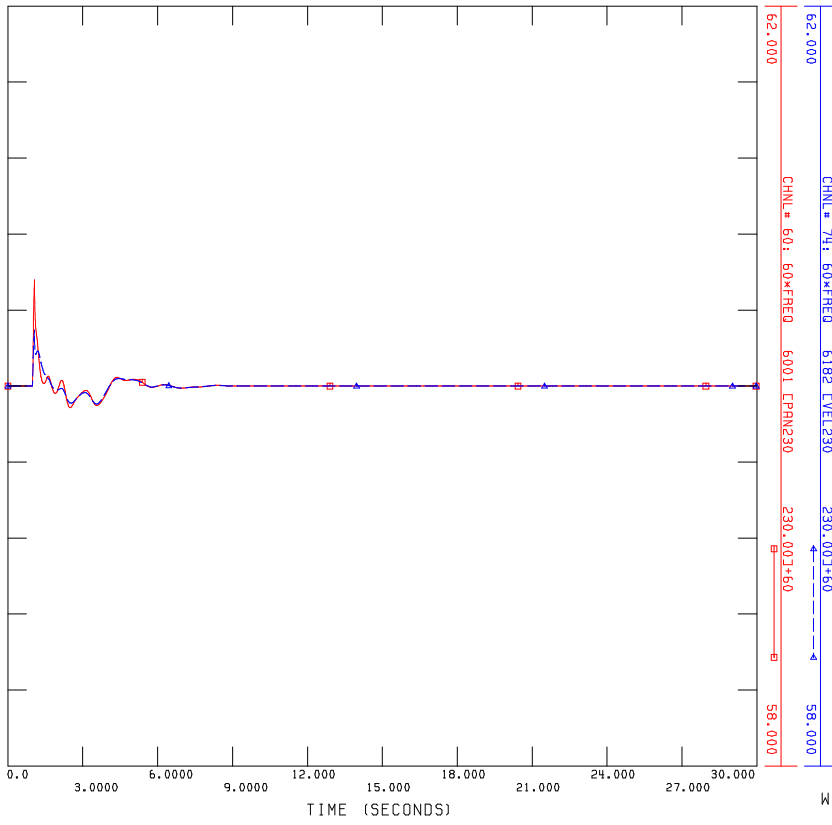
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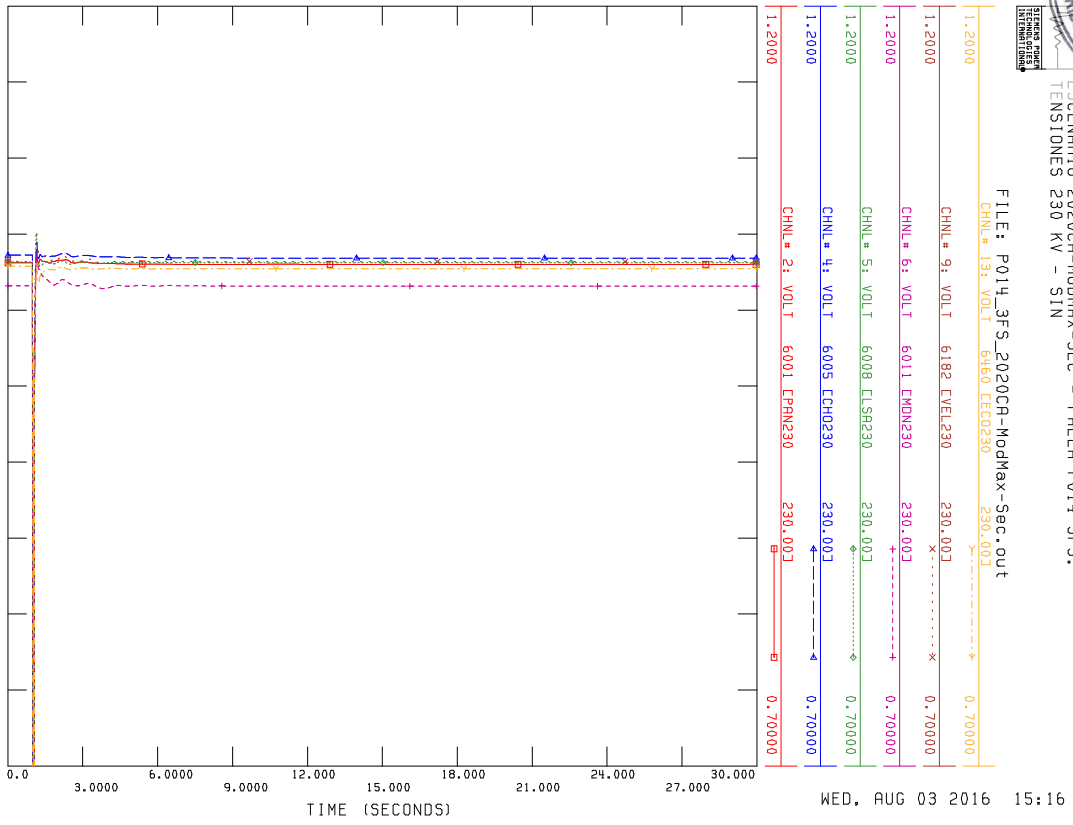
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DE MONITOREO

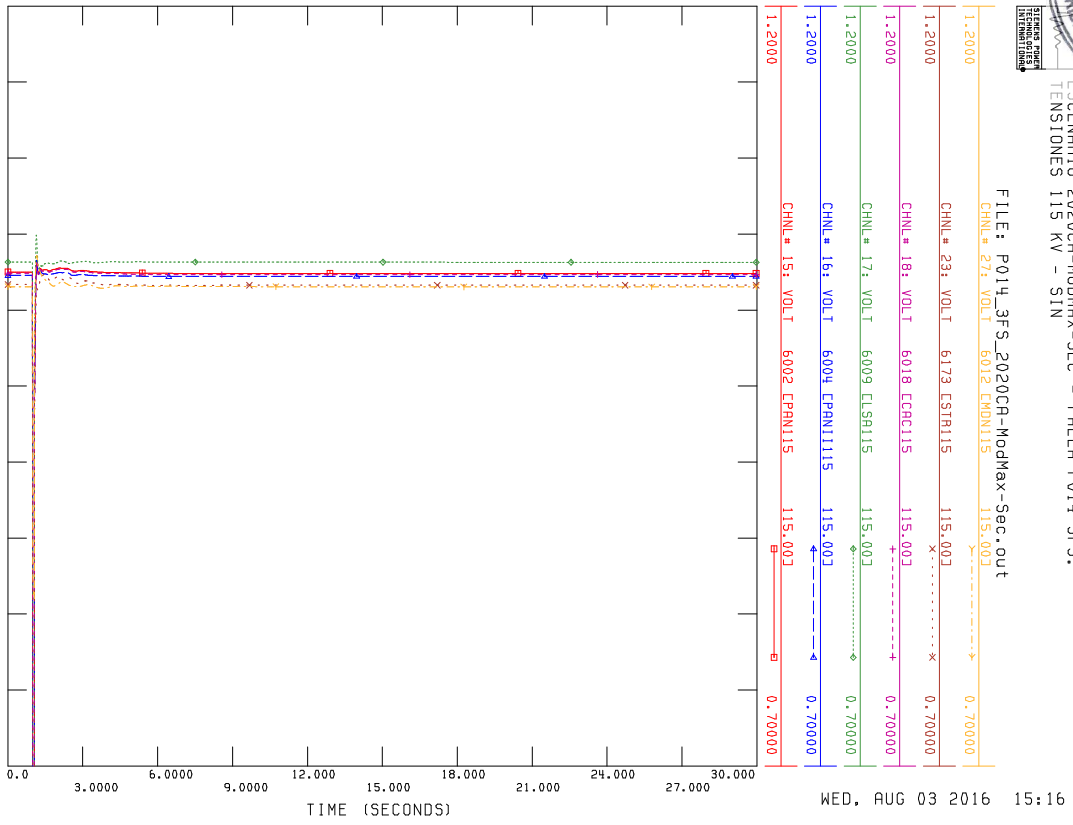
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FRECUENCIAS.

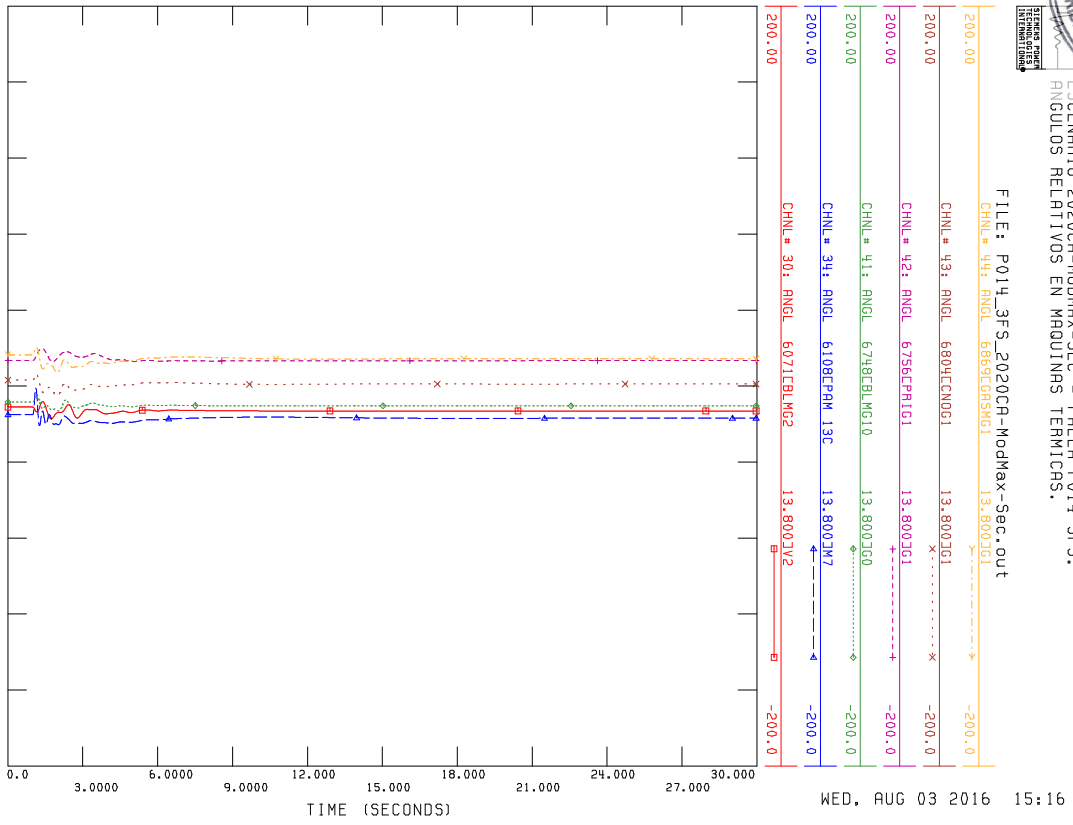
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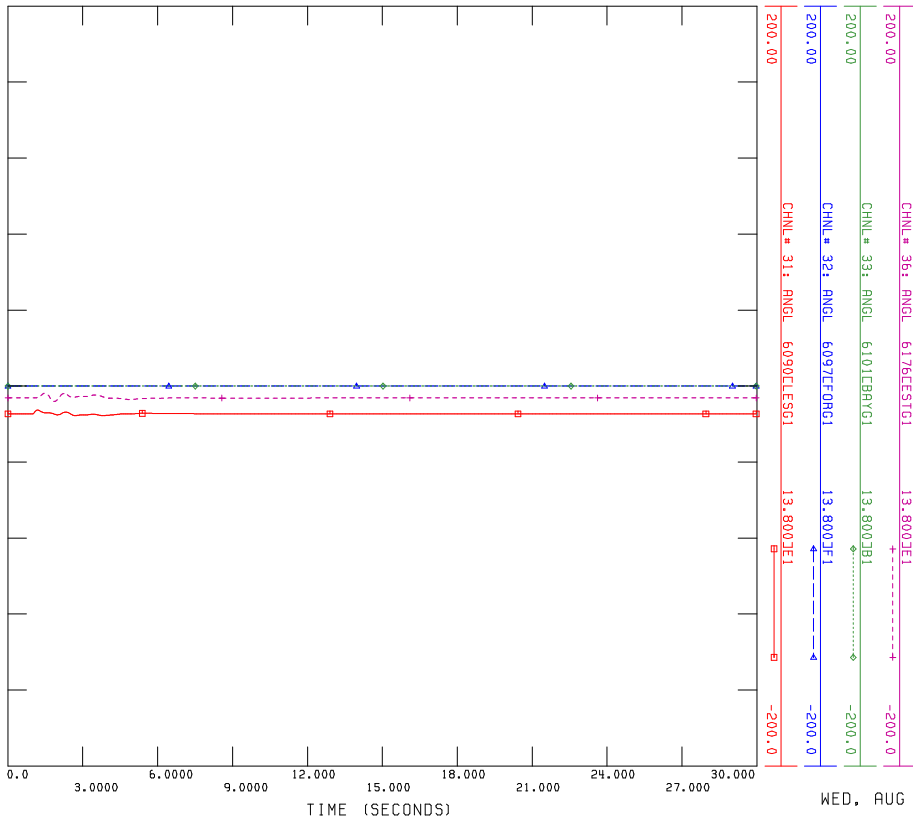






ESCENARIO 2020CA-MODMAX-SEC - FALLA P014 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICHS.

FILE: P014\_3FS\_2020CA-ModMax-Sec.out

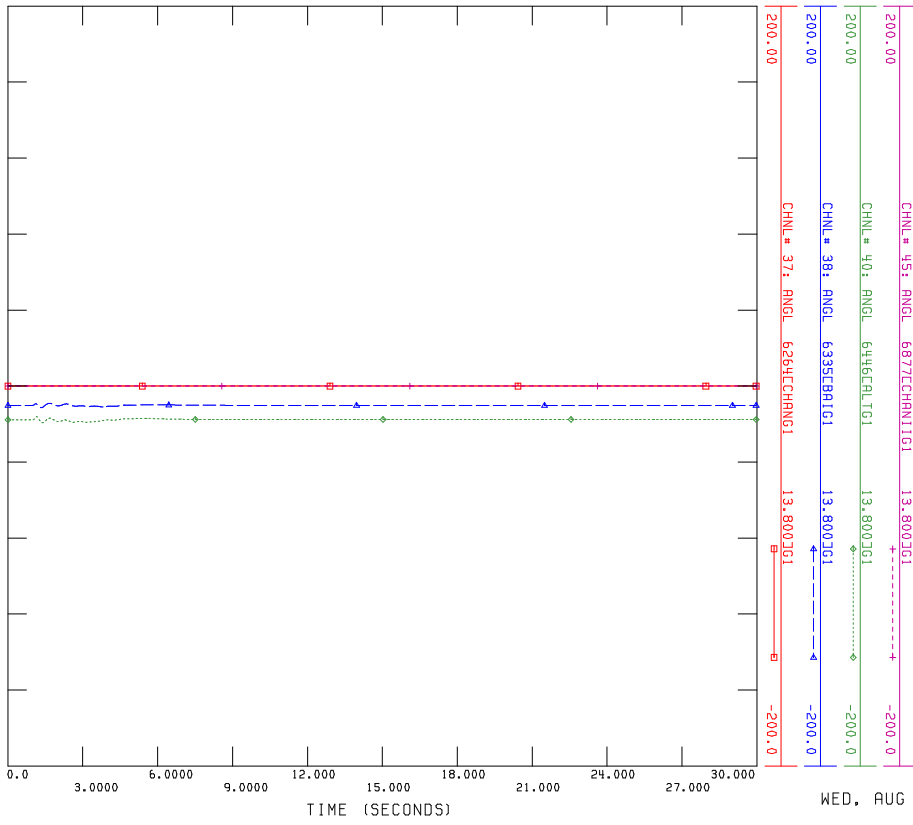


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P014 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

FILE: P014\_3FS\_2020CA-ModMax-Sec.out



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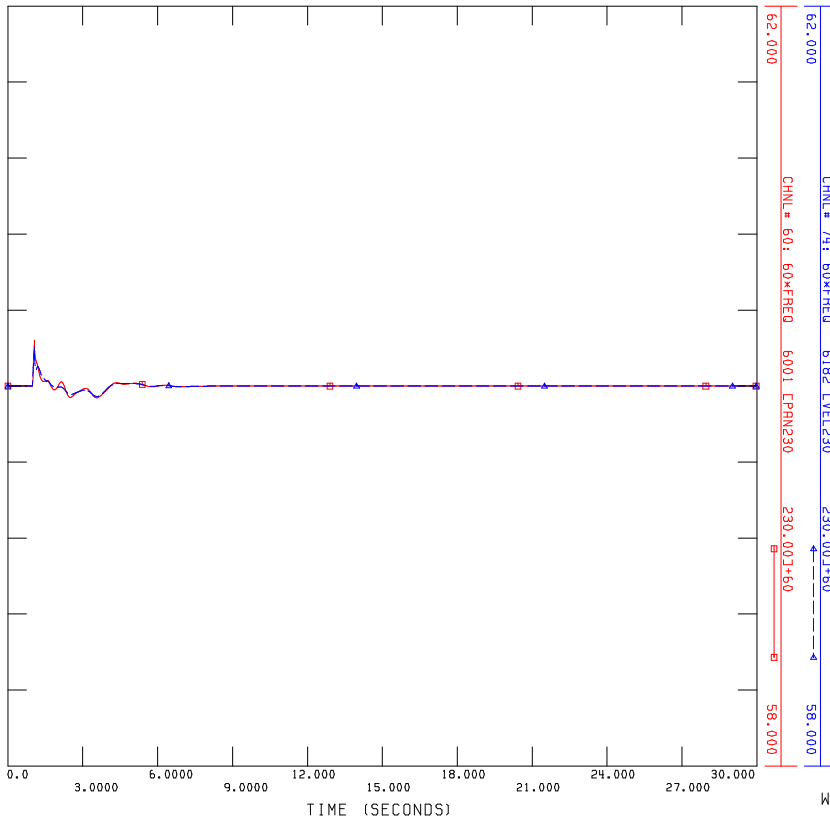


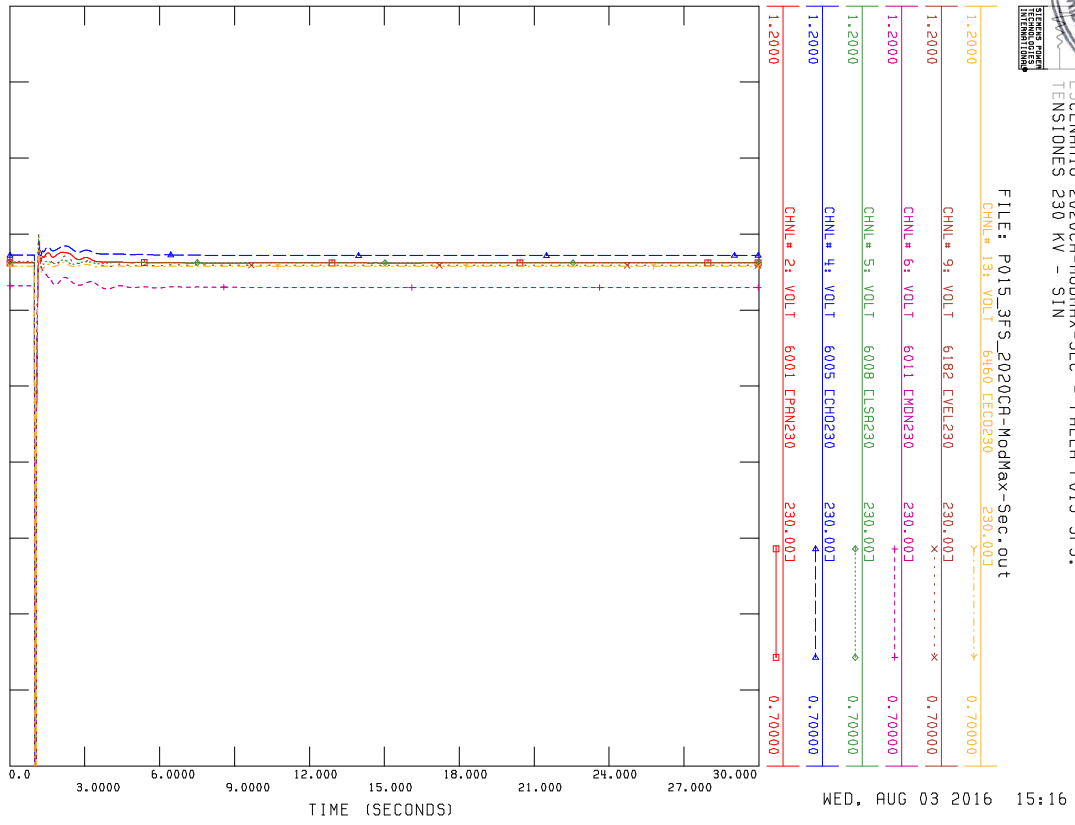


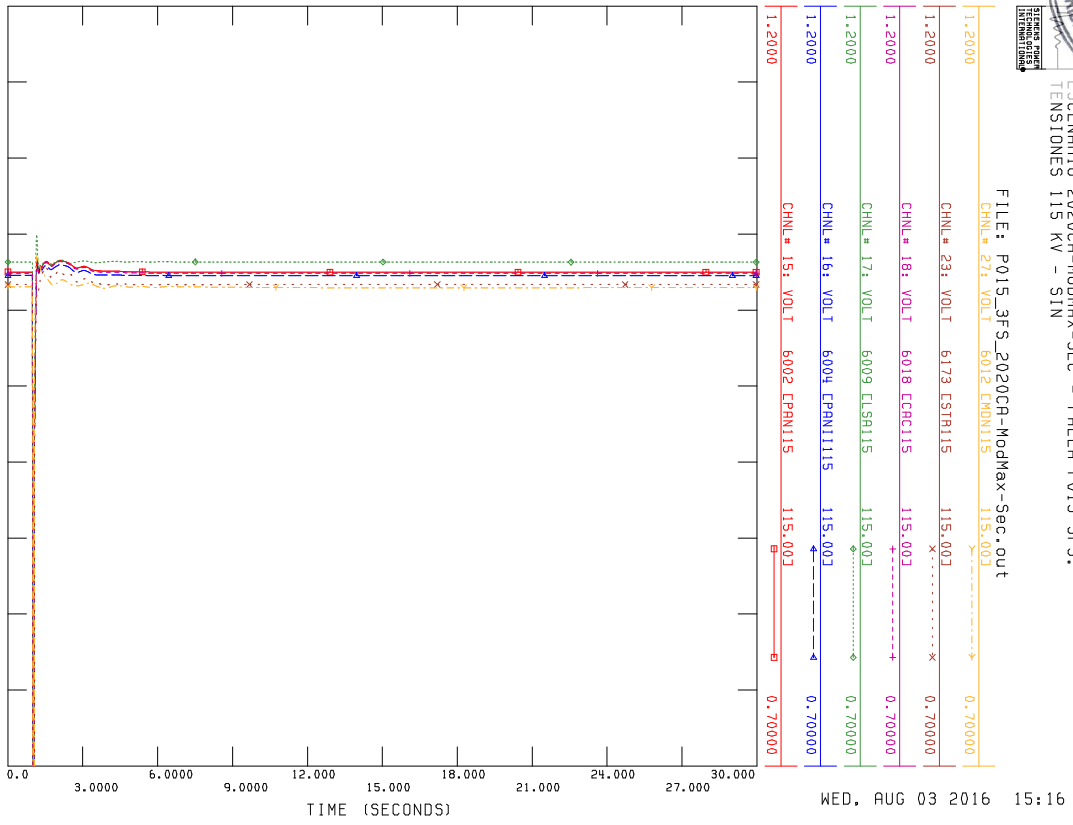
ESTACION DE MONITOREO

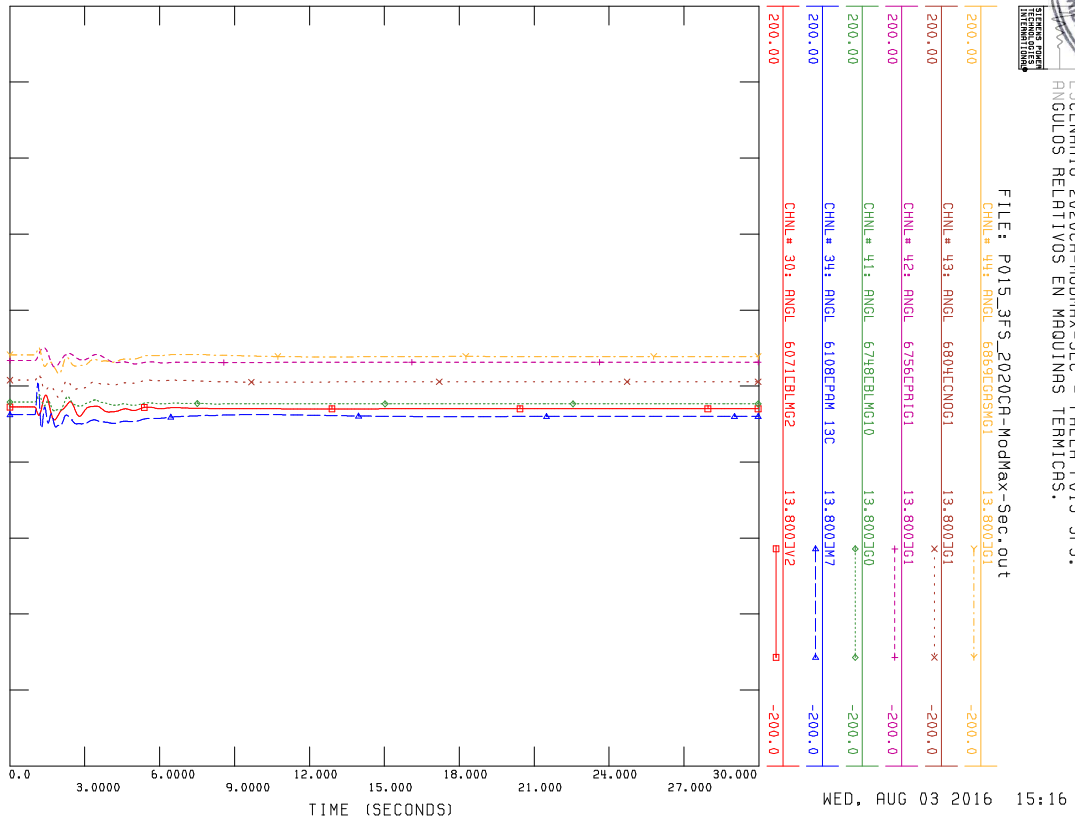
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FRECUENCIAS.

FILE: P014\_3FS\_2020CA-ModMax-Sec.out





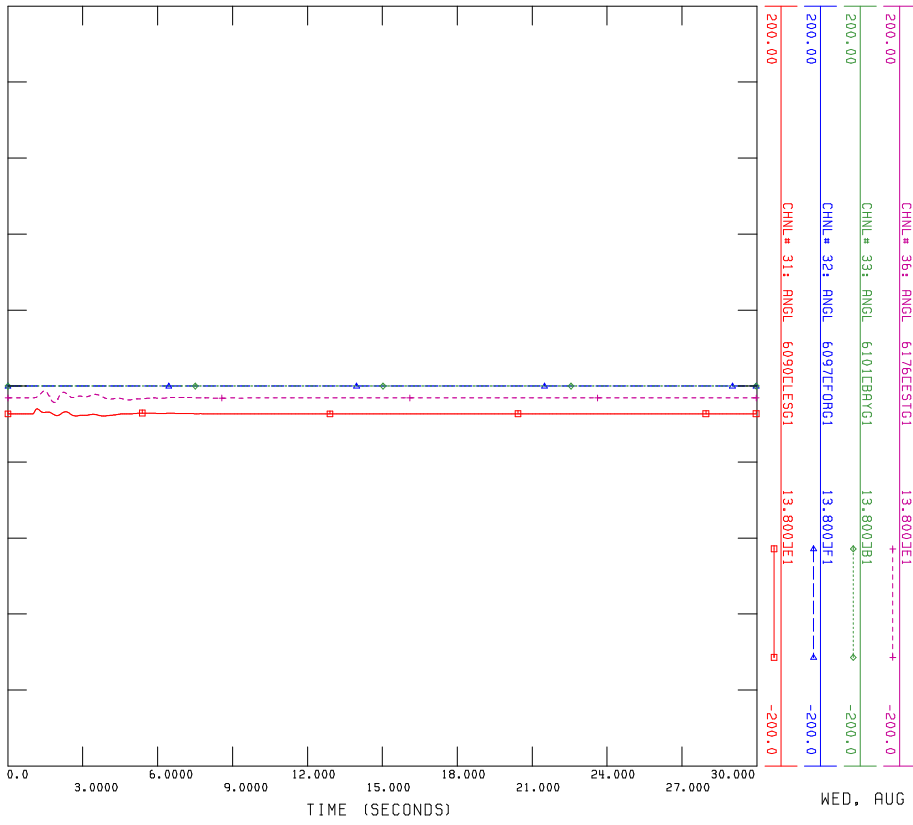






ESCENARIO 2020CA-MODMAX-SEC - FALLA P015 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

FILE: P015\_3FS\_2020CA-ModMax-Sec.out



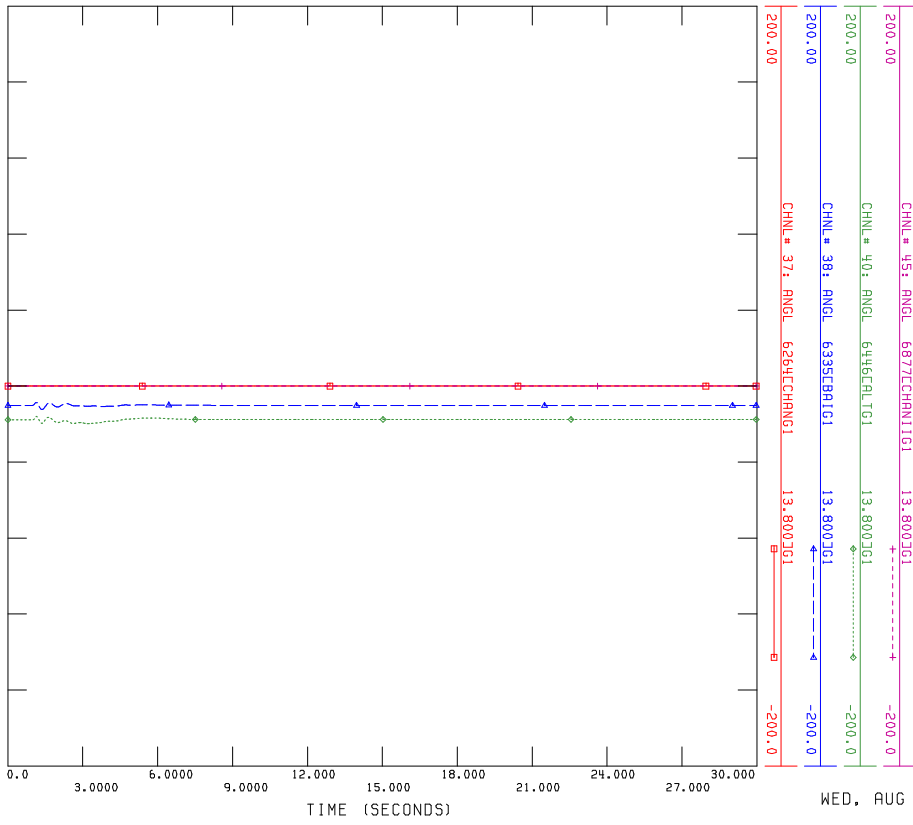
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SERVICIO  
INFORMACIÓN

ESCENARIO 2020CA-MODMAX-SEC - FALLA P015 3FS.  
ÁNGULOS RELATIVOS EN MÁQUINAS HIDRÁULICAS.

FILE: P015\_3FS\_2020CA-ModMax-Sec.out



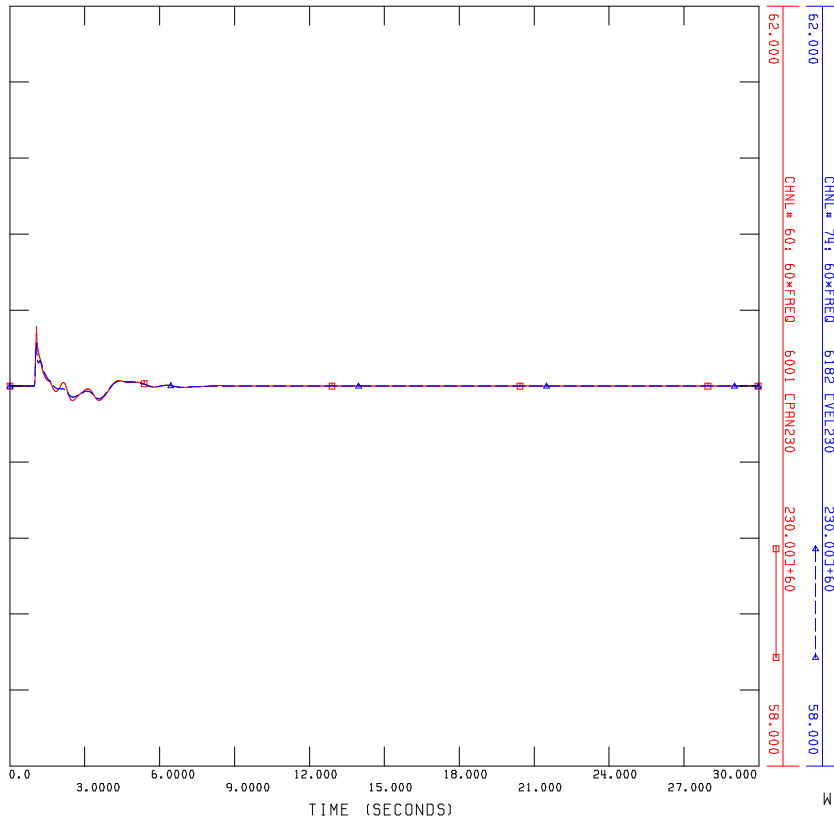
WED, AUG 03 2016 15:16



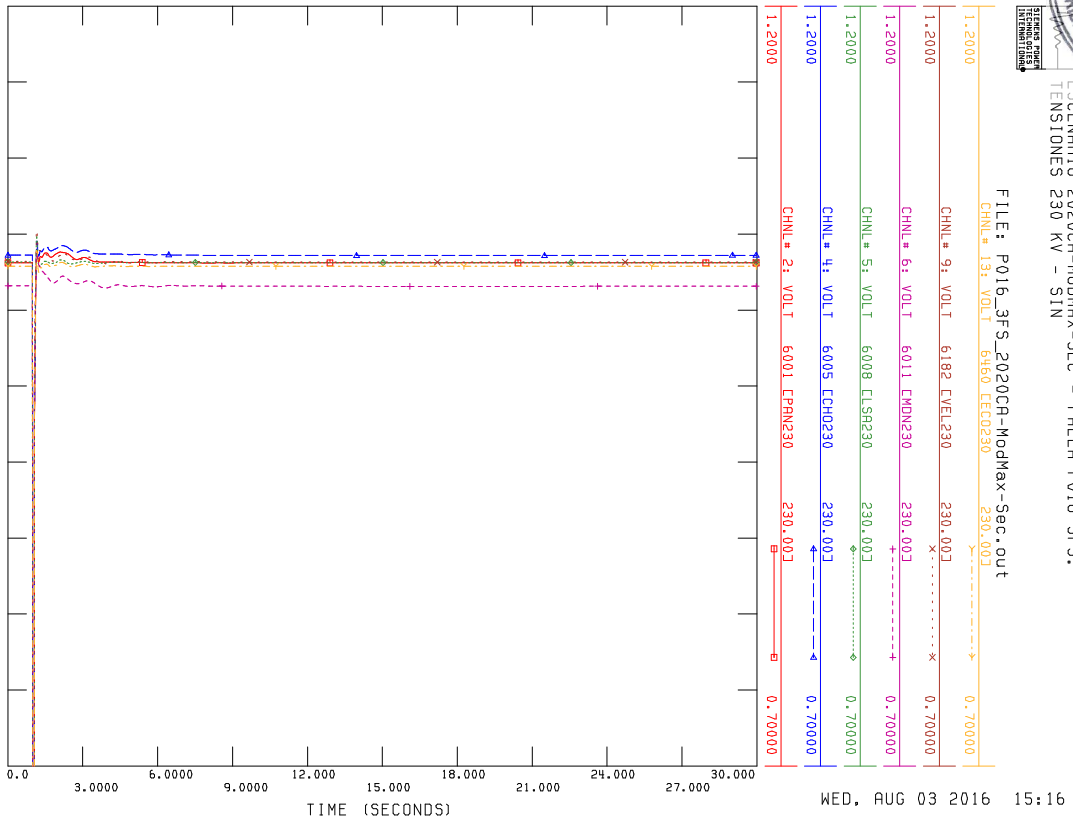
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ESCENARIO 2020CA-MODMAX-SEC - FALLA P015 3FS.  
FRECUENCIAS.

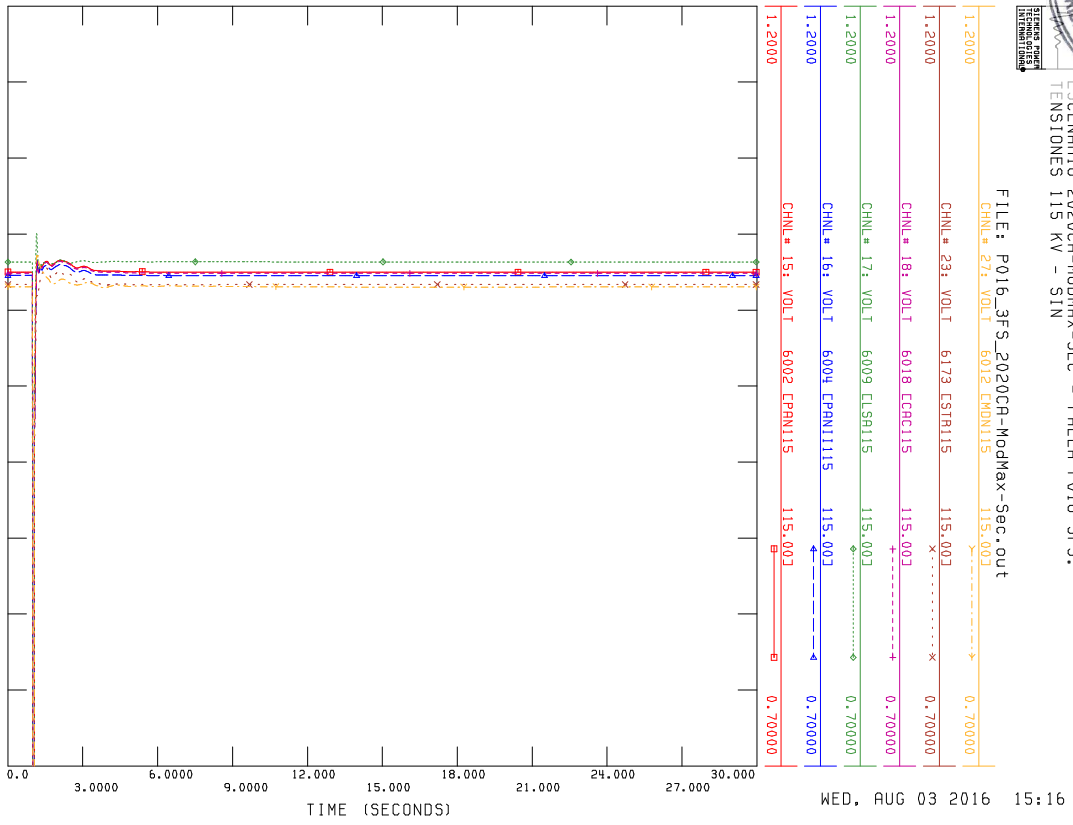
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WED, AUG 03 2016 15:16

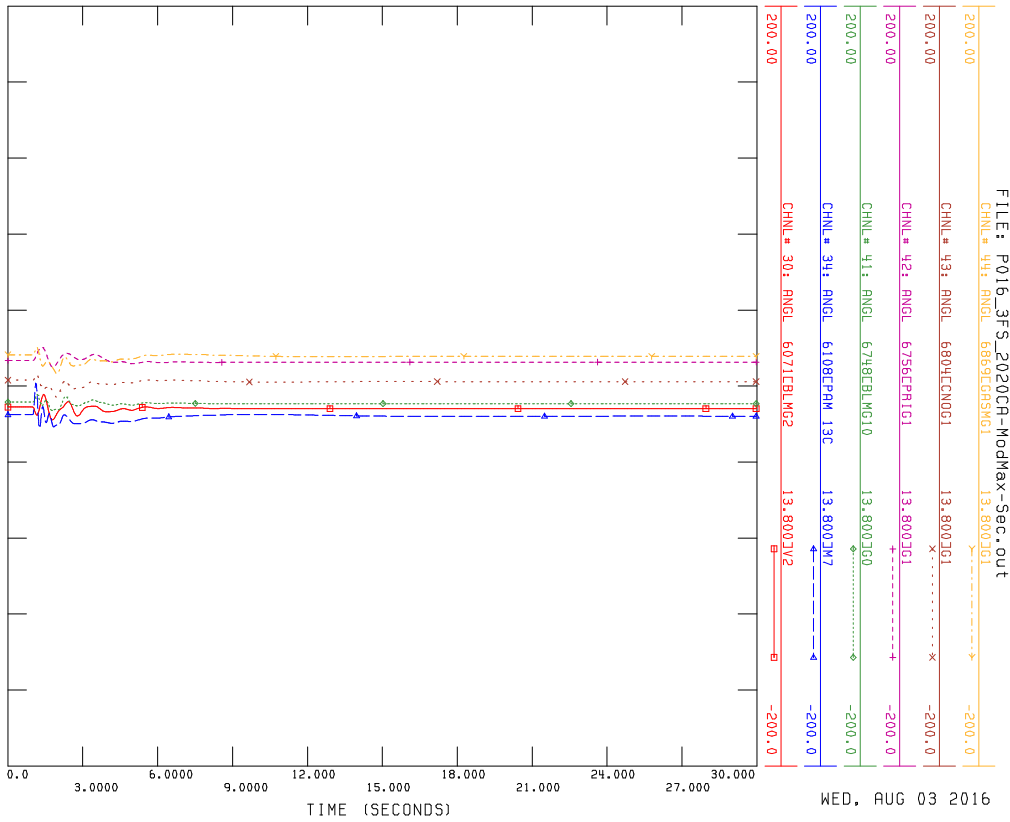








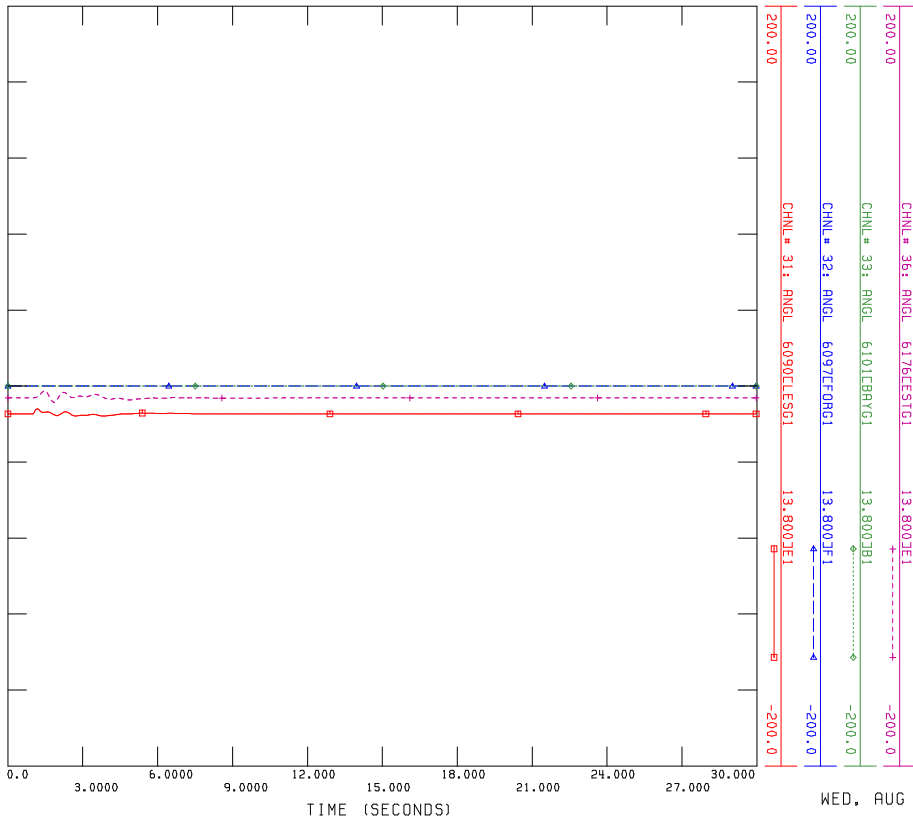
ESCENARIO 2020CA-MODMAX-SEC - FALLA P016 3FS.  
 ANGULOS RELATIVOS EN MAGNITUDES TERMICAS.





ESCENARIO 2020CA-MODMAX-SEC - FALLA P016 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

FILE: P016\_3FS\_2020CA-ModMax-Sec.out

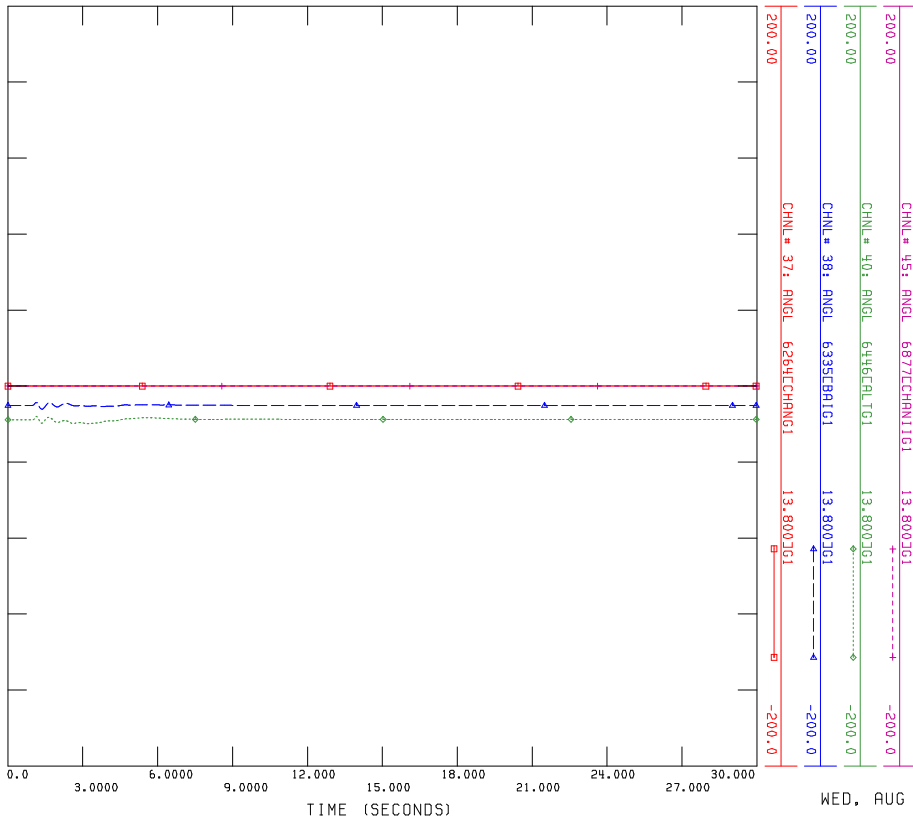


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P016 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

FILE: P016\_3FS\_2020CA-ModMax-Sec.out

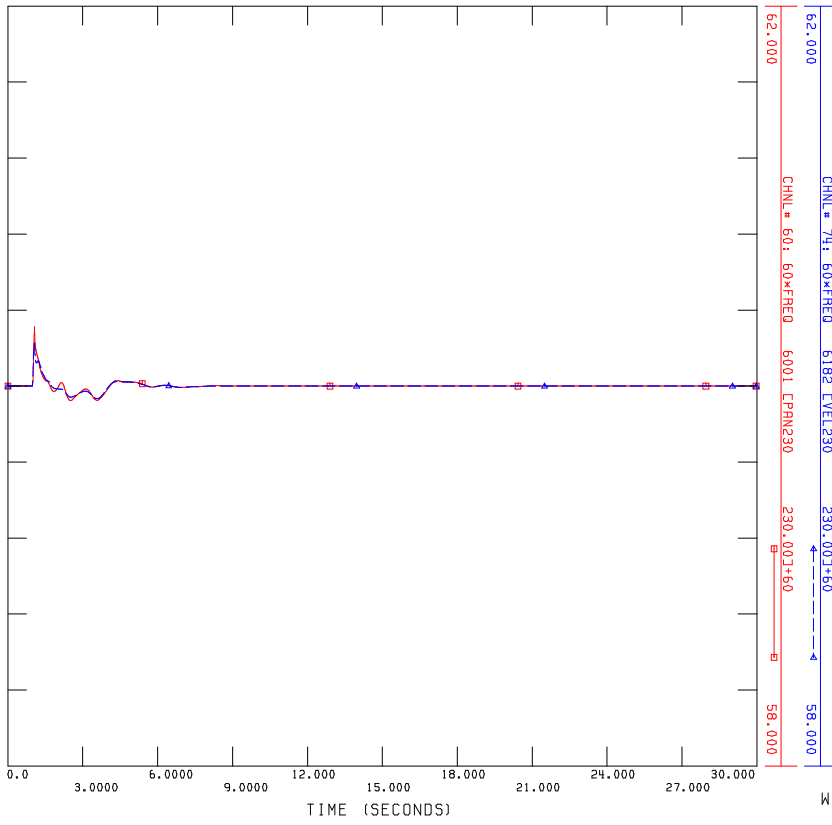


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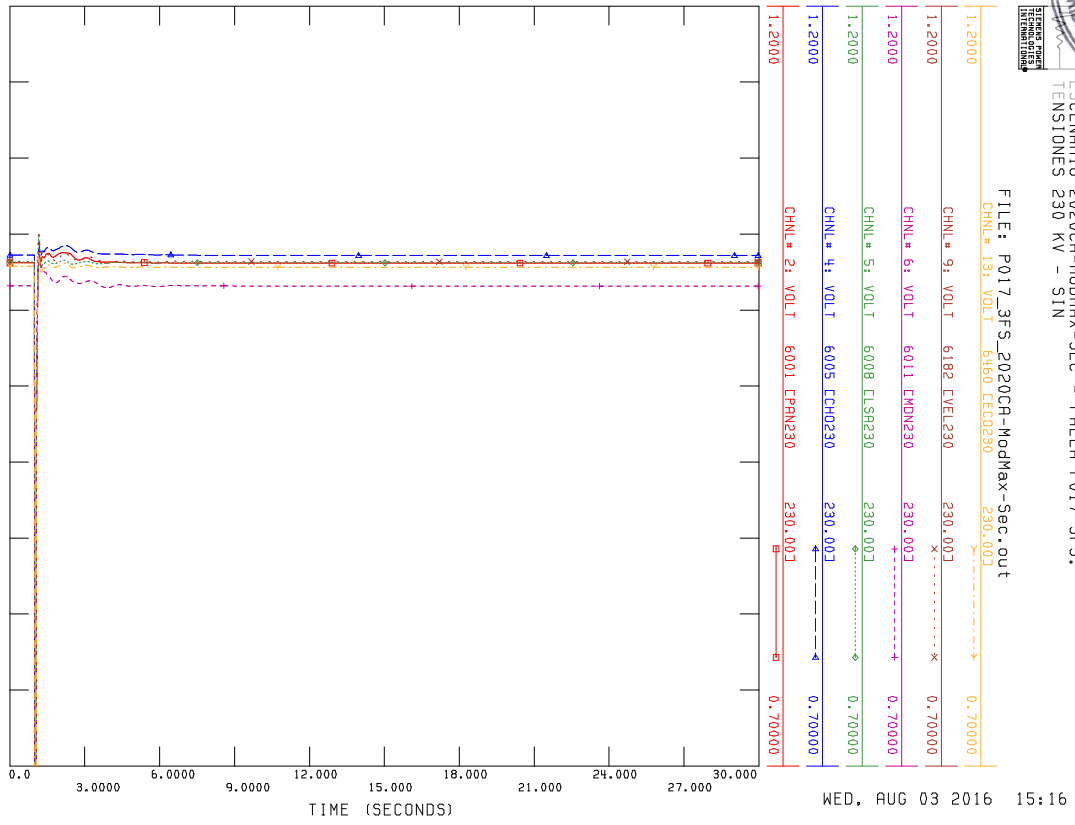


ESCENARIO 2020CA-MODMAX-SEC - FALLA P016 3FS.  
 FRECUENCIAS.

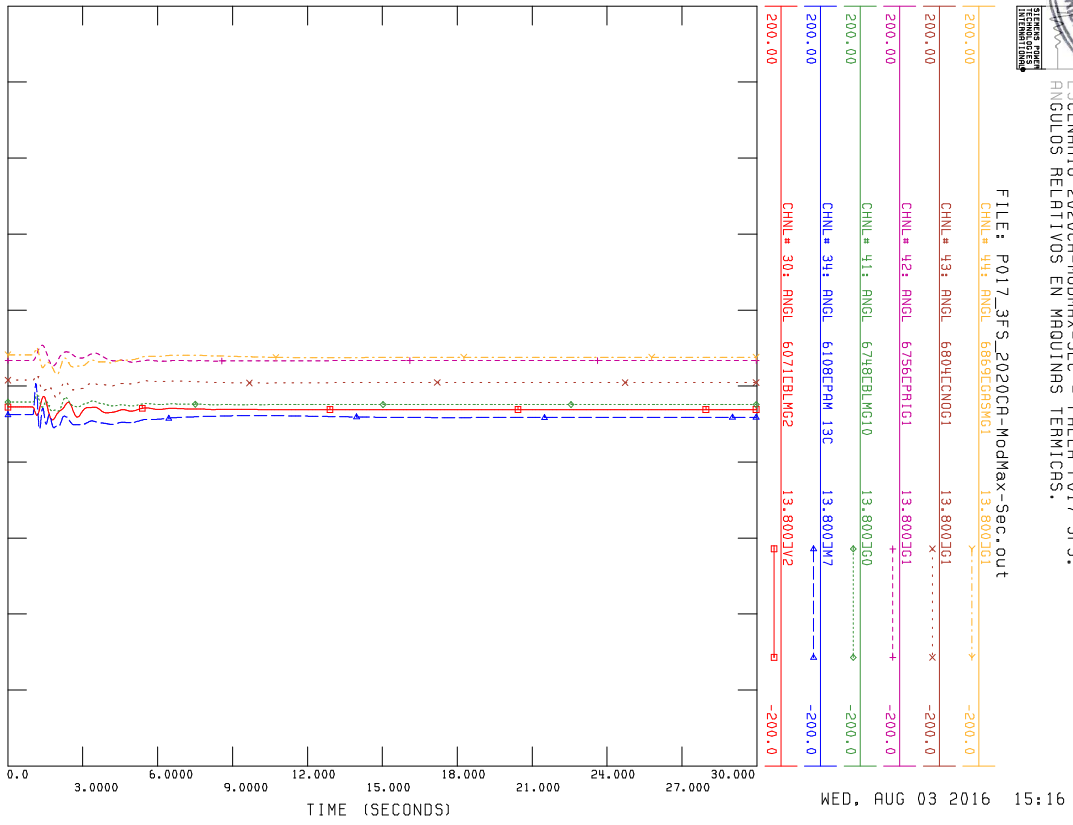
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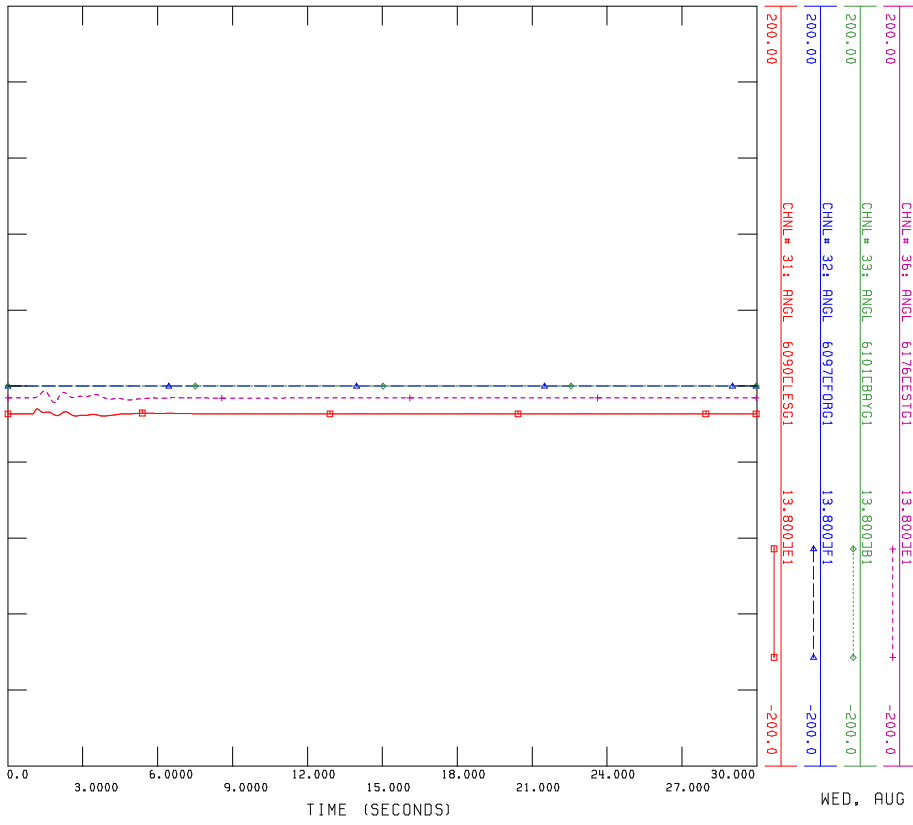






ESCENARIO 2020CA-MODMAX-SEC - FALLA P017 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

FILE: P017\_3FS\_2020CA-ModMax-Sec.out

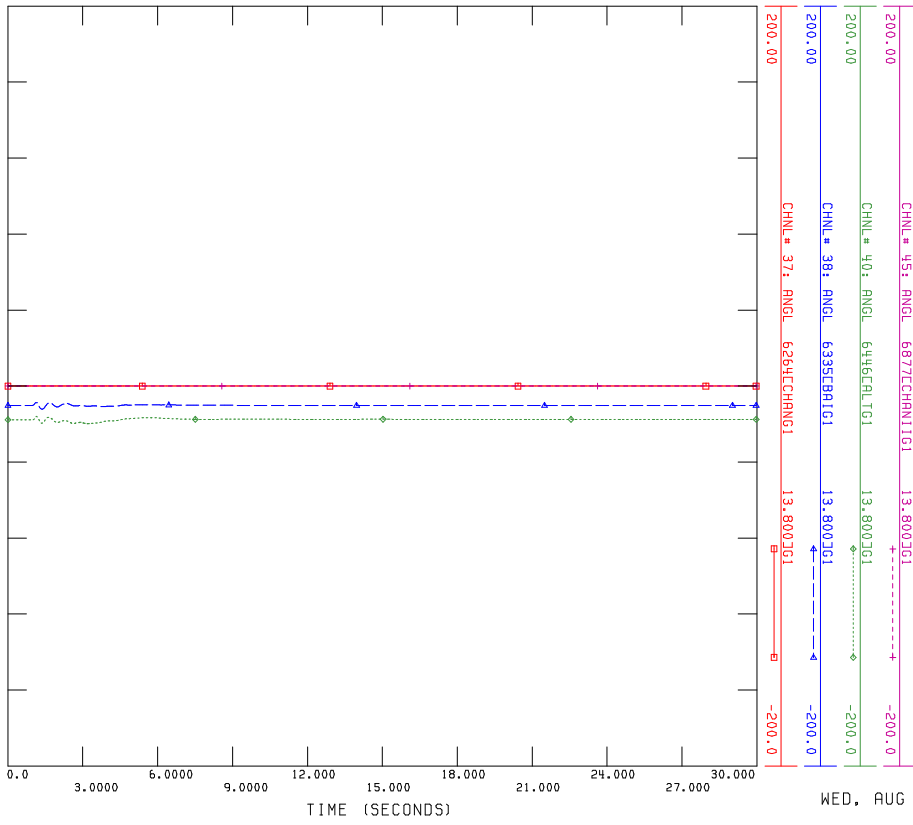


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P017 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

FILE: P017\_3FS\_2020CA-ModMax-Sec.out



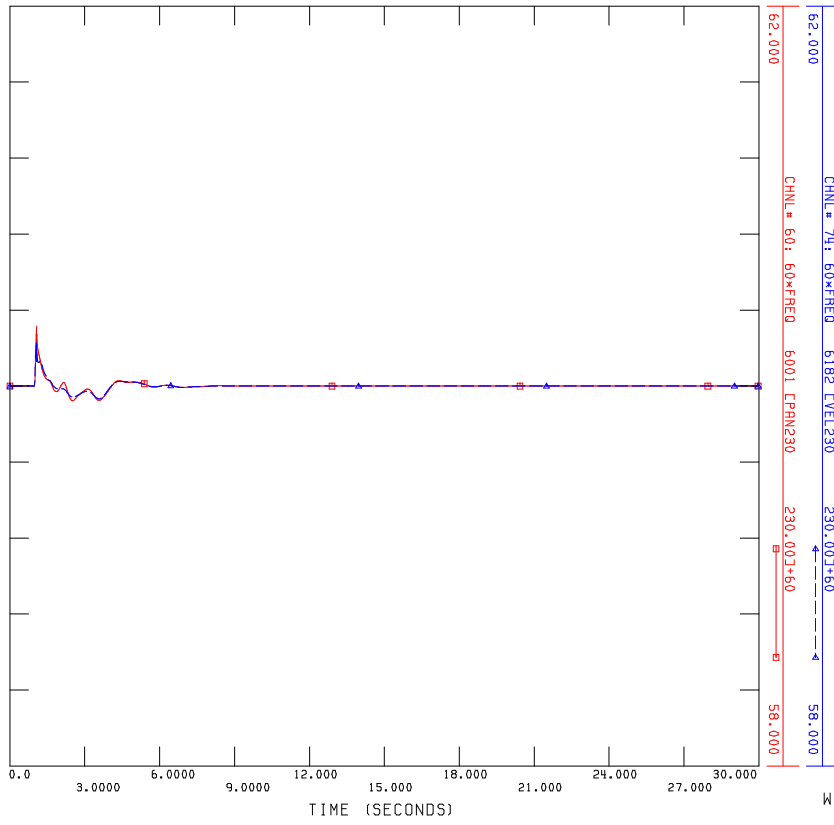
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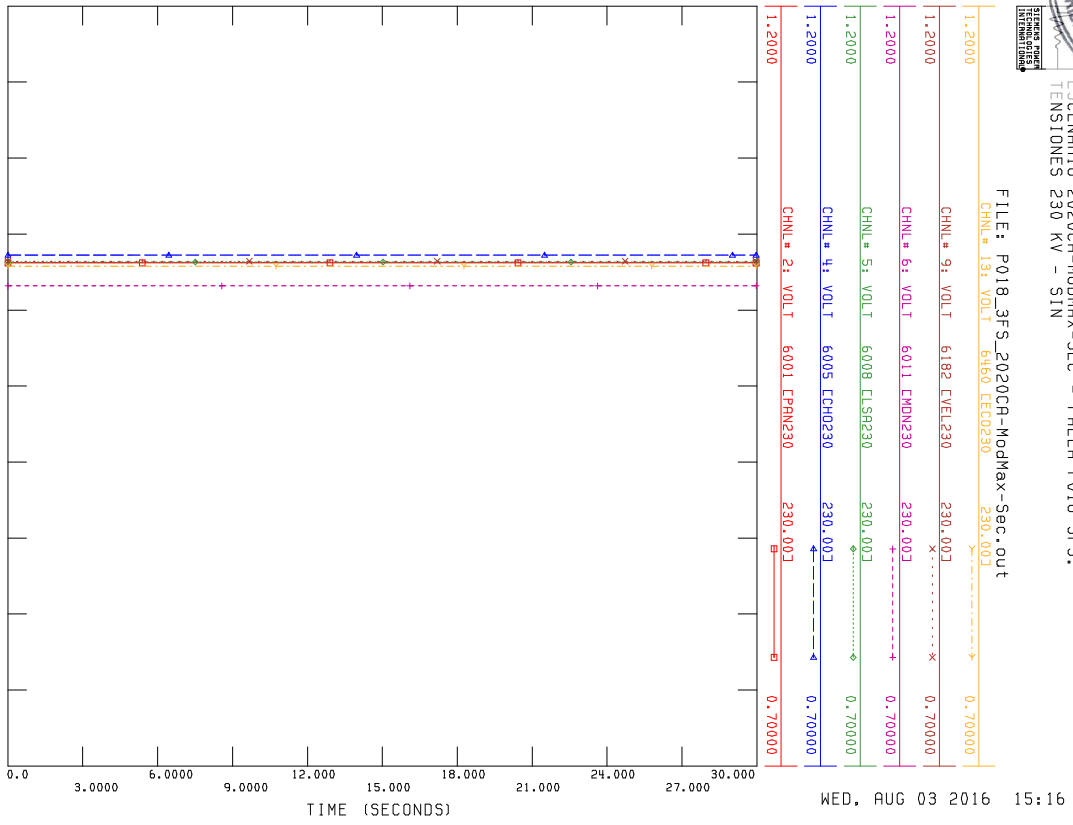
ESTACION  
DE MONITOREO

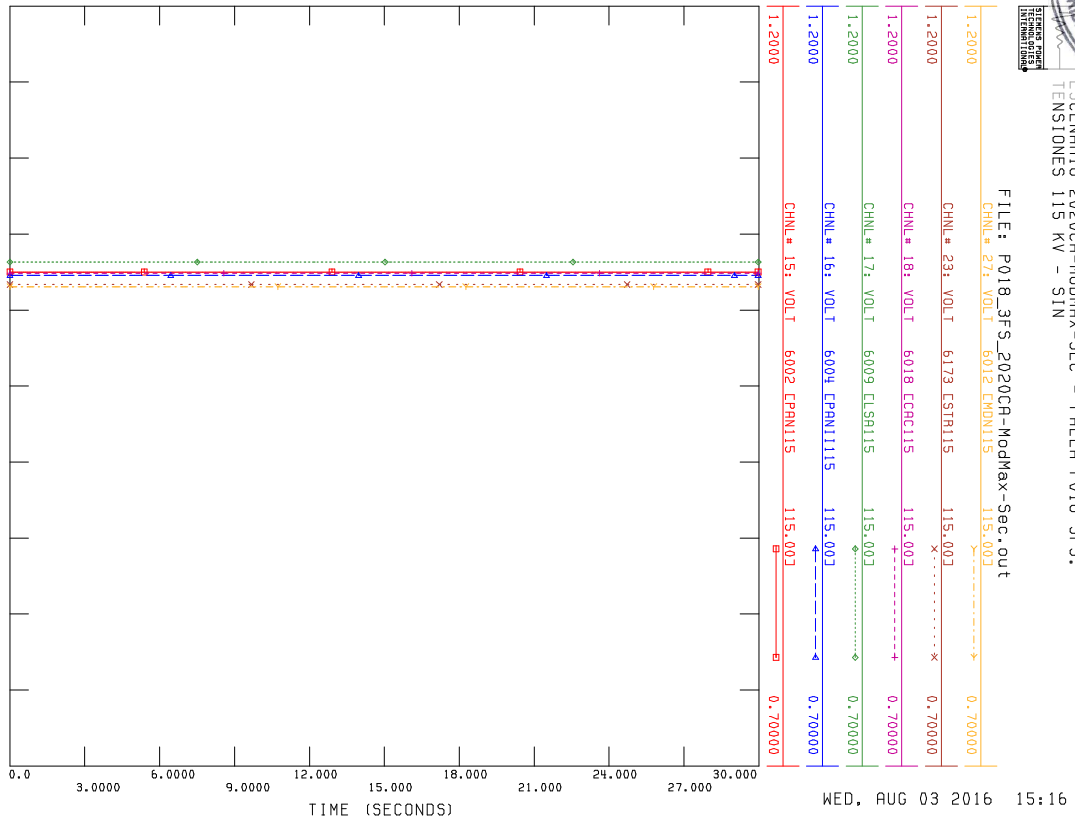
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FRECUENCIAS.

FILE: P017\_3FS\_2020CA-ModMax-Sec.out



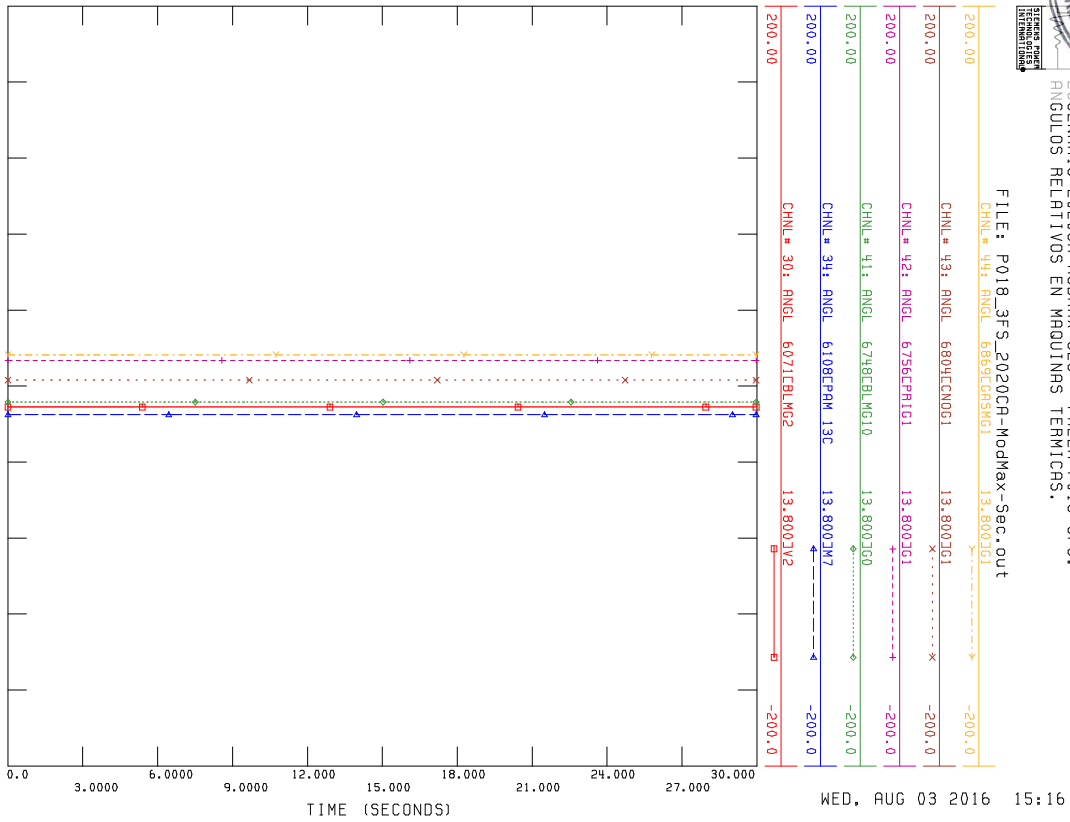
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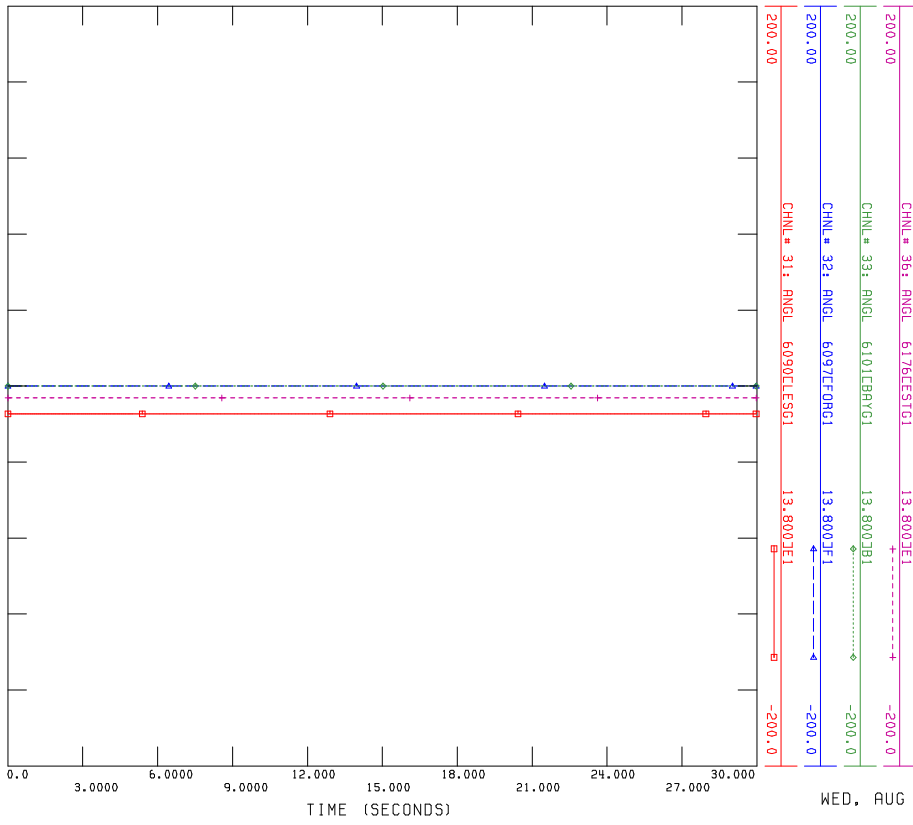
ESCENARIO 2020CA-MODMAX-SEC - FALLA P018 3FS.  
 ANGULOS RELATIVOS EN MAGNINS TERCICAS.





ESCENARIO 2020CA-MODMAX-SEC - FALLA P018 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

FILE: P018\_3FS\_2020CA-ModMax-Sec.out

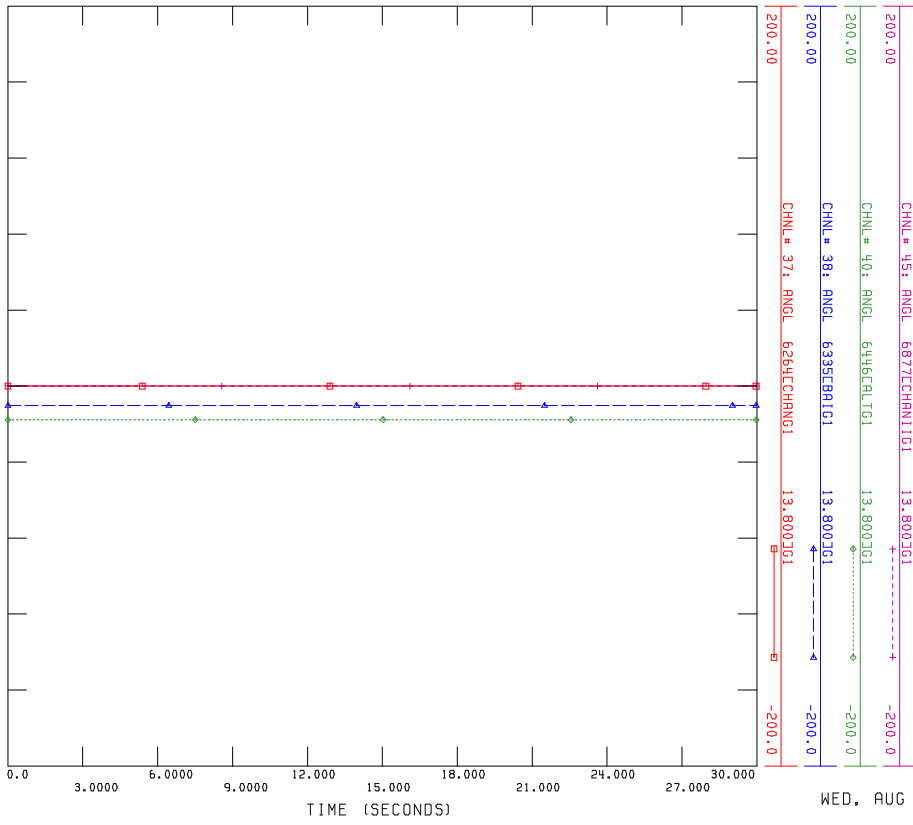


WED, AUG 03 2016 15:16



ESCENARIO 2020CA-MODMAX-SEC - FALLA P018 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

FILE: P018\_3FS\_2020CA-ModMax-Sec.out



WED, AUG 03 2016 15:16

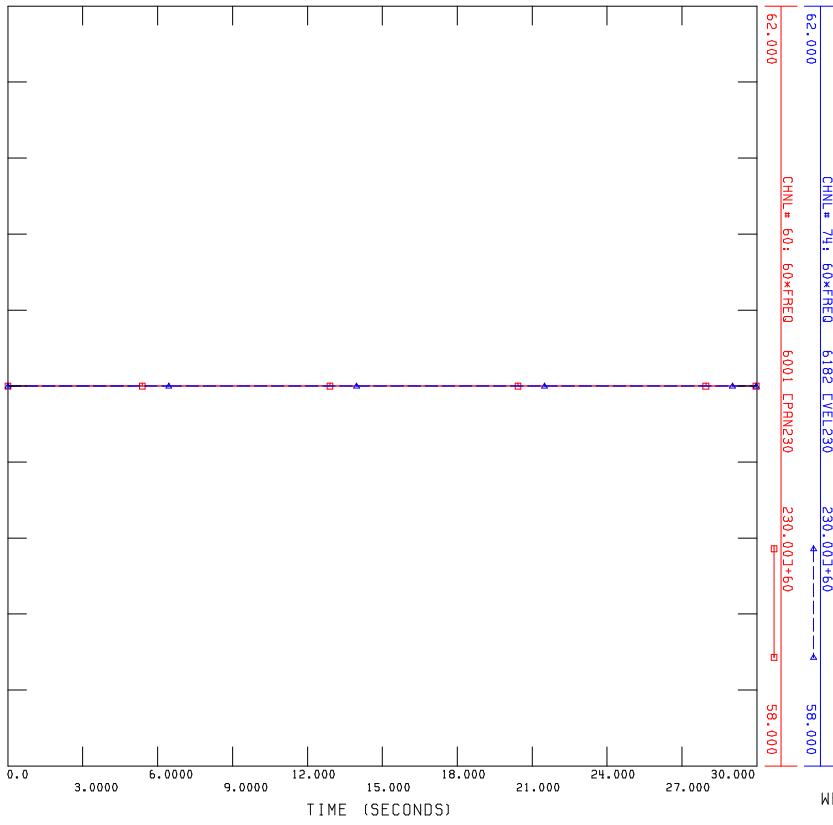




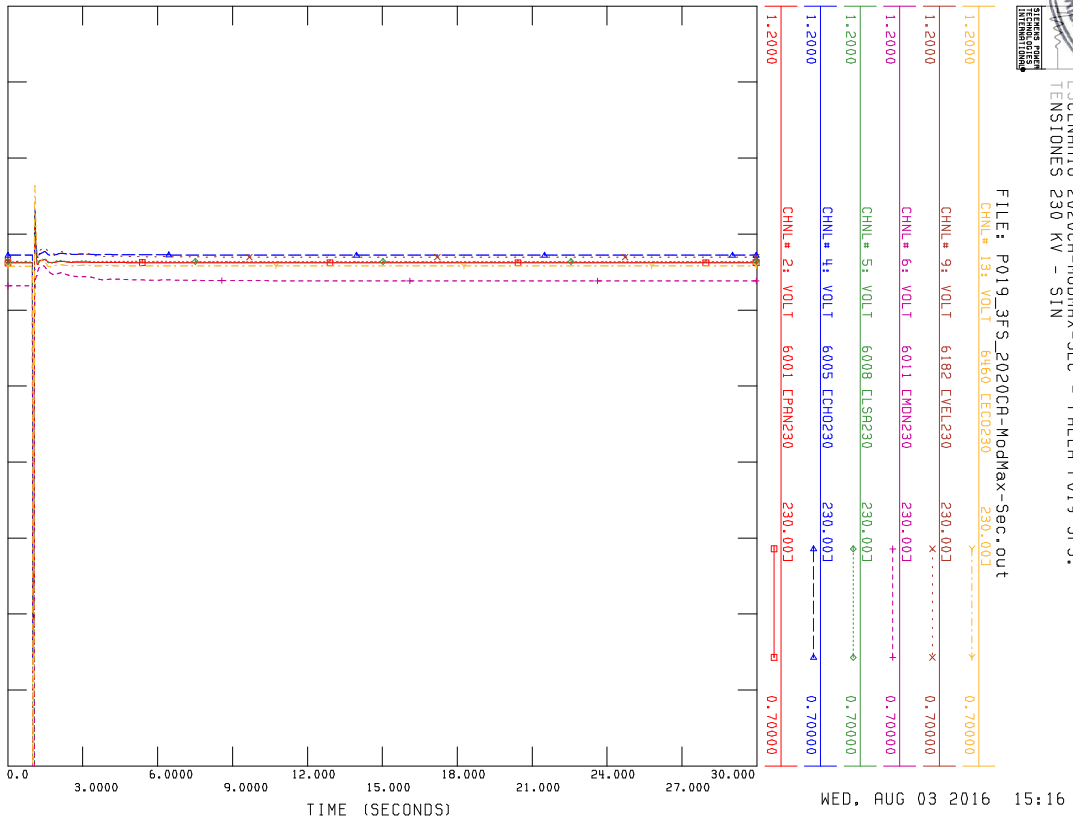
ESTACION  
DE MONITOREO

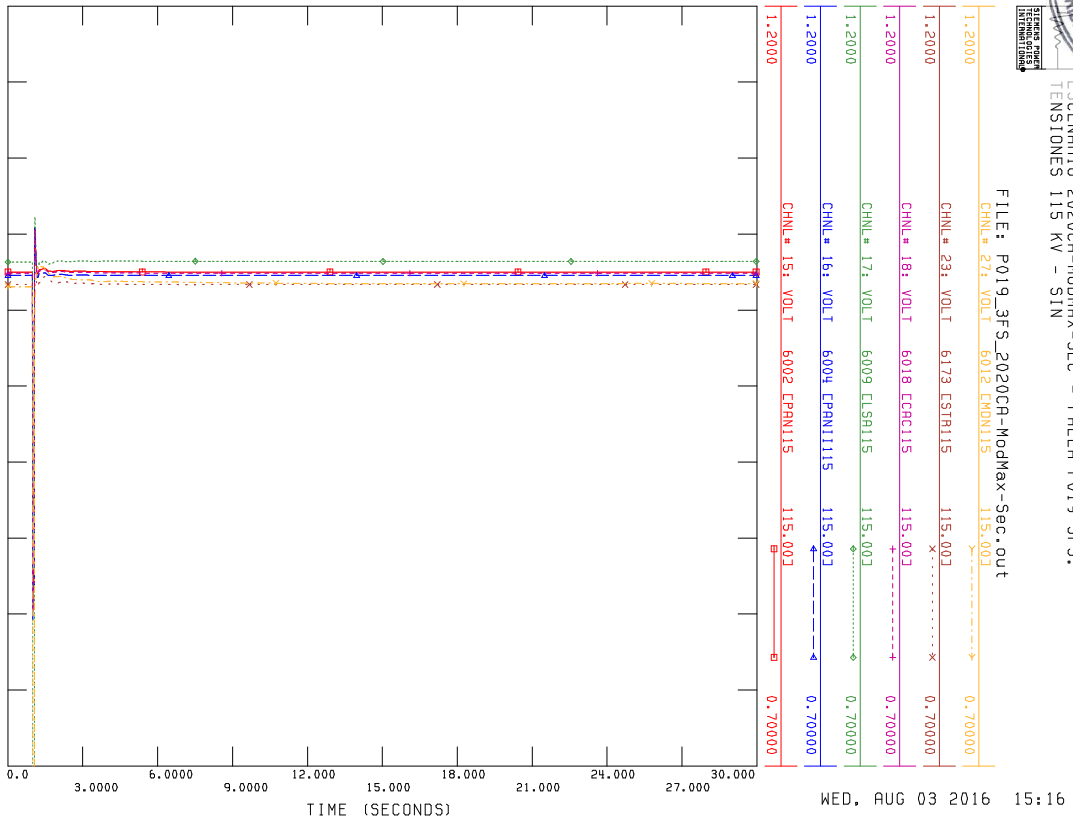
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FRECUENCIAS.

FILE: P018\_3FS\_2020CA-ModMax-Sec.out



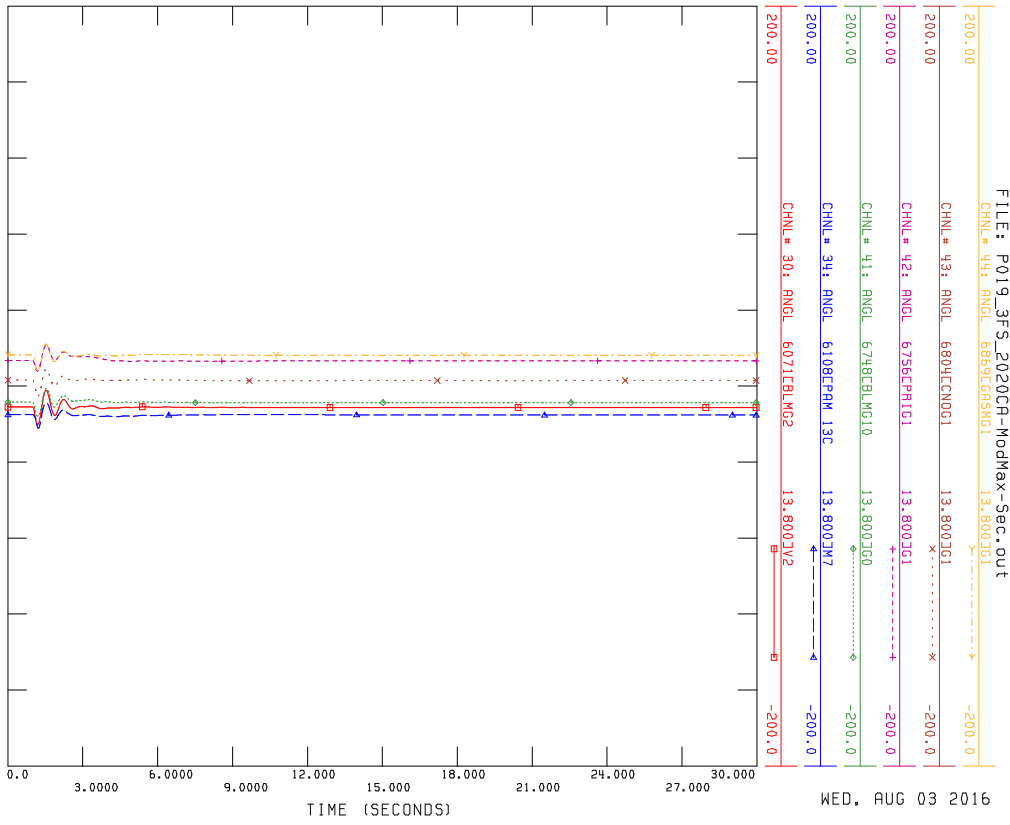
WED, AUG 03 2016 15:16







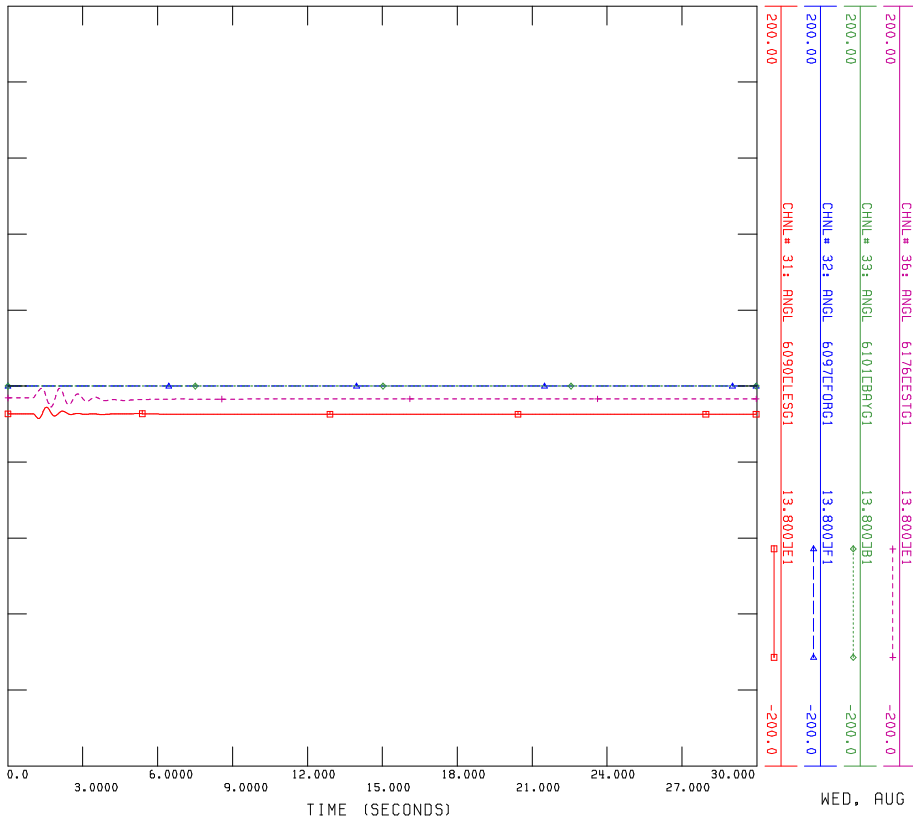
ESCENARIO 2020CA-MODMAX-SEC - FALLA P019 3FS.  
ANGULOS RELATIVOS EN MQUINNS TERMICHS.





ESCENARIO 2020CA-MODMAX-SEC - FALLA P019 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

FILE: P019\_3FS\_2020CA-ModMax-Sec.out

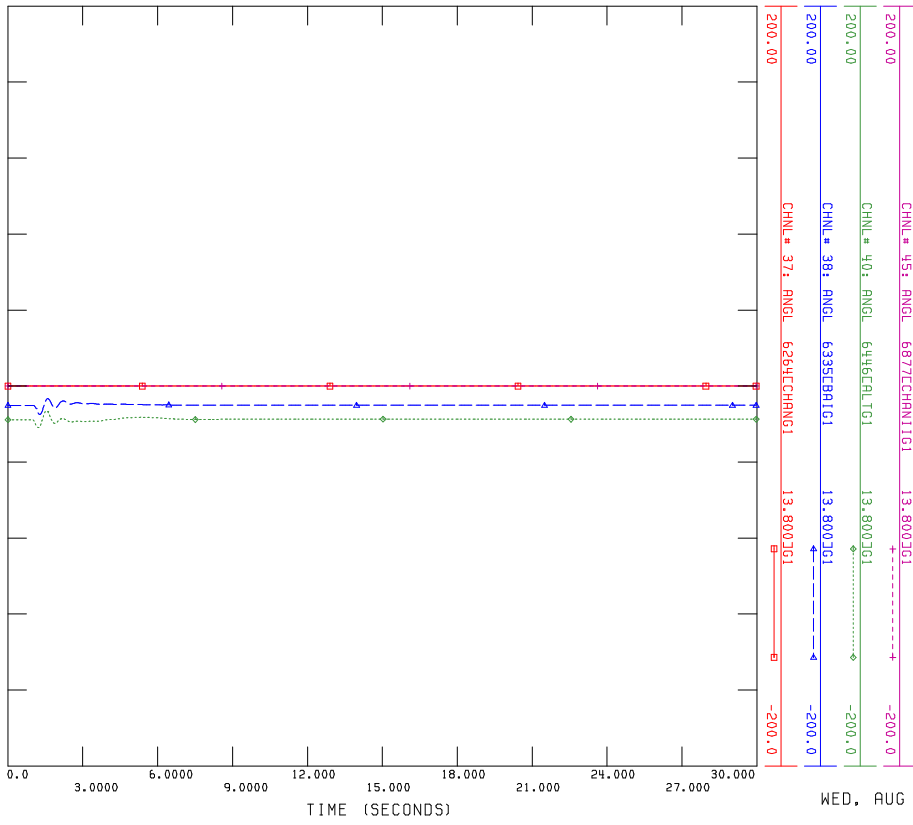


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P019 3FS.  
 ANGULOS RELATIVOS EN MQUINRS HIDRAULICAS.

FILE: P019\_3FS\_2020CA-ModMax-Sec.out

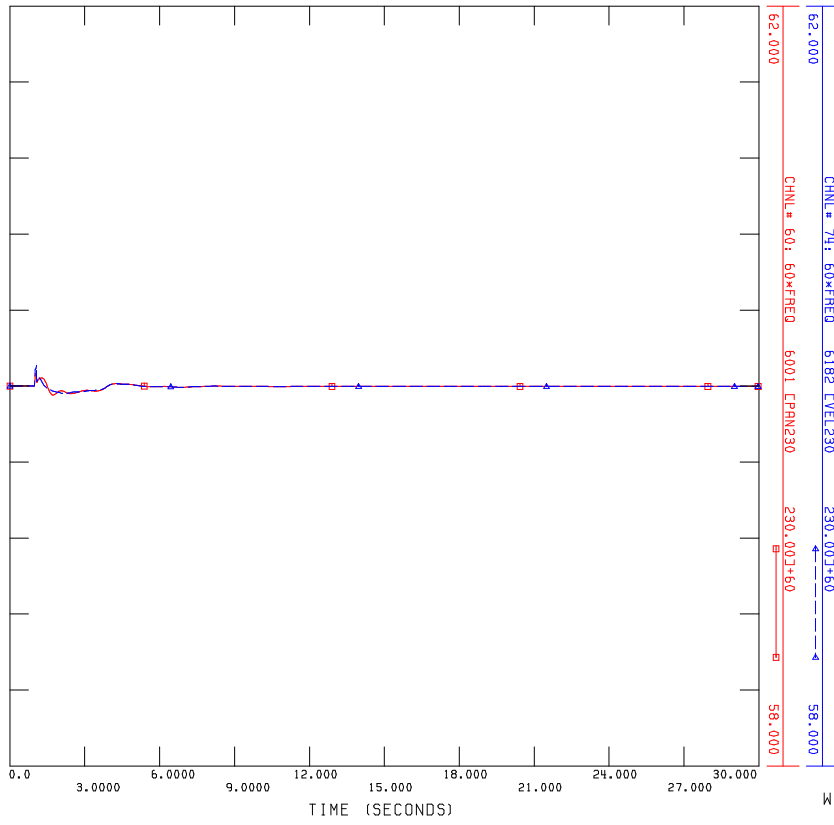


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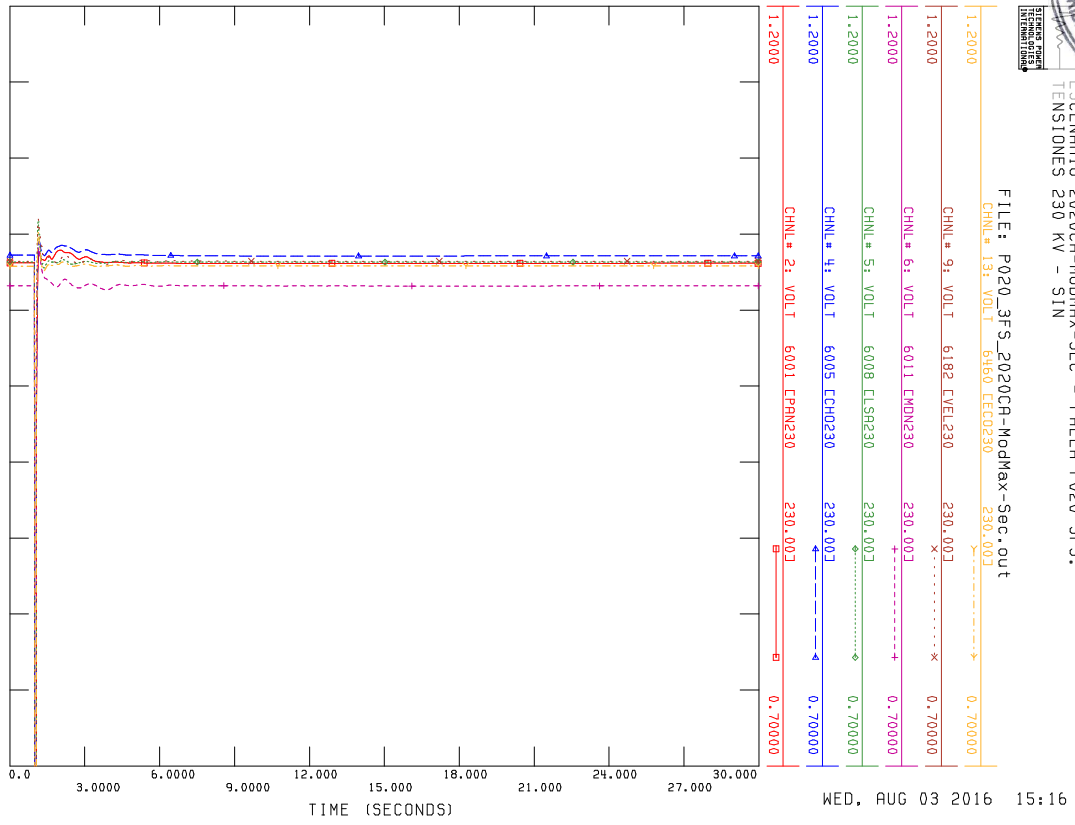


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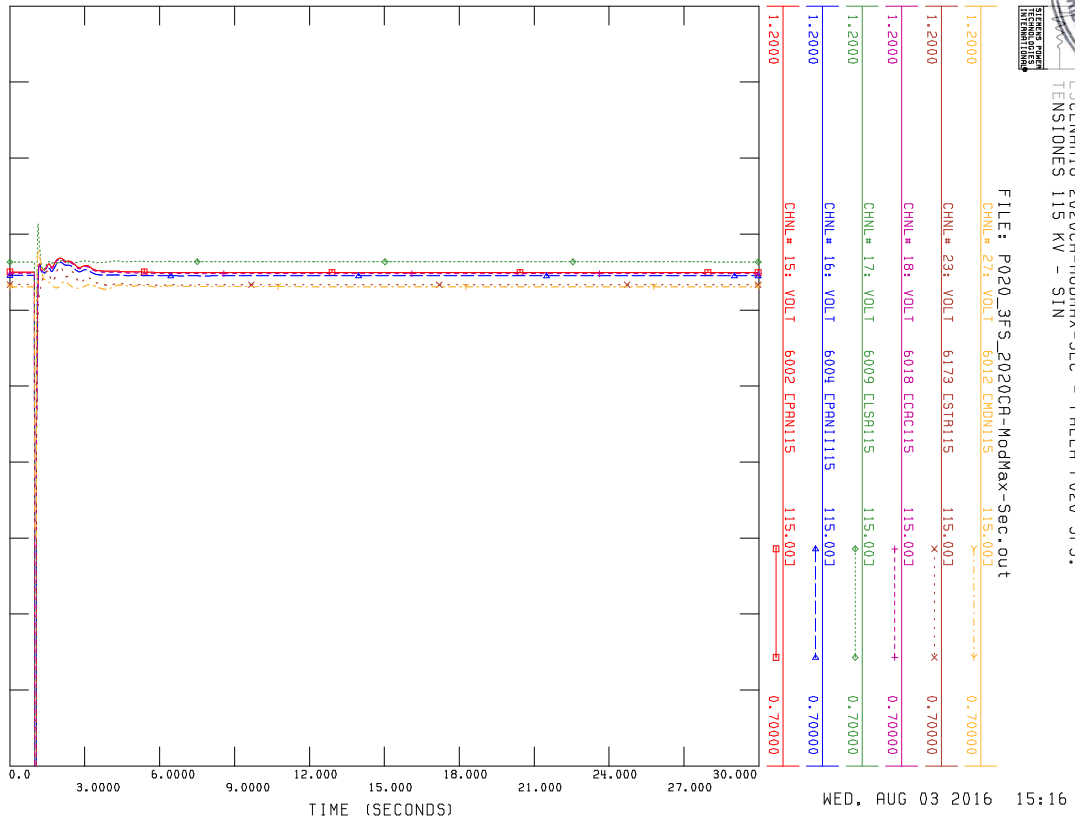
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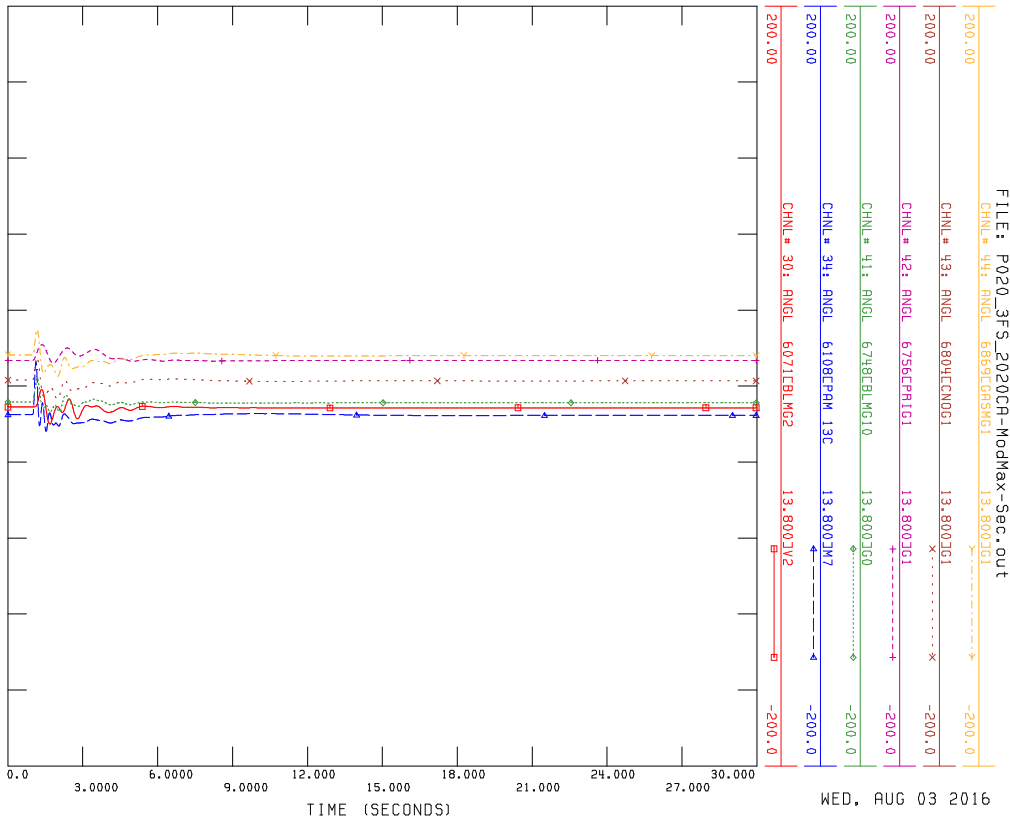








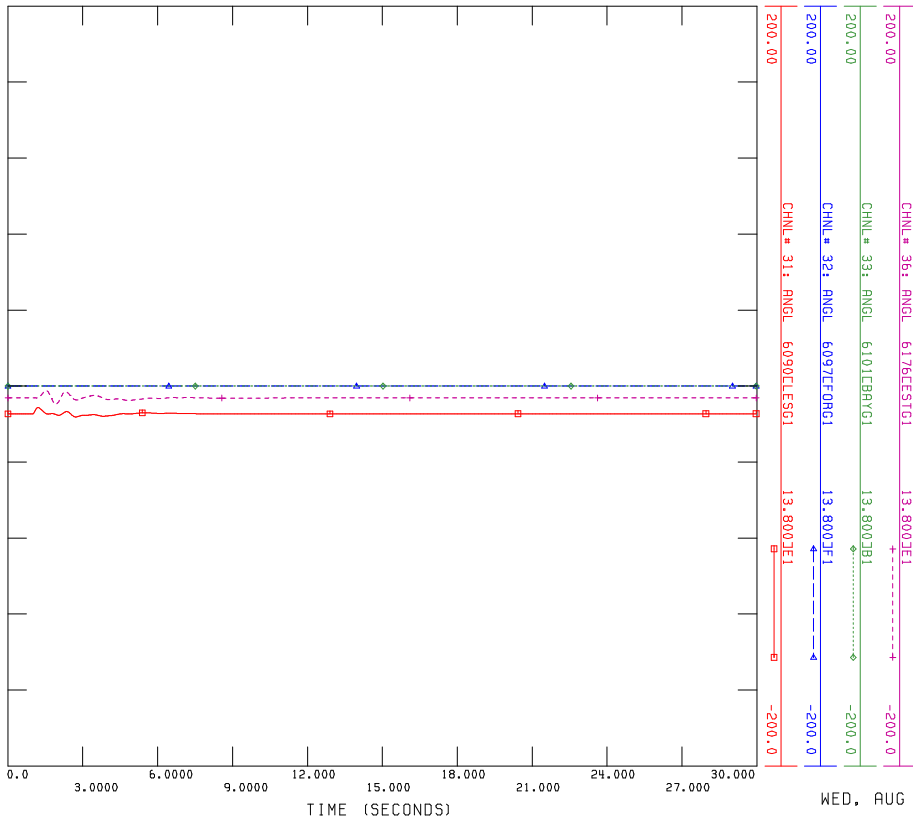
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ANGULOS RELATIVOS EN MQUINNS TERMICAS.





ESCENARIO 2020CA-MODMAX-SEC - FALLA P020 3FS.  
 ANGULOS RELATIVOS EN MQUINNS HIDRAULICAS.

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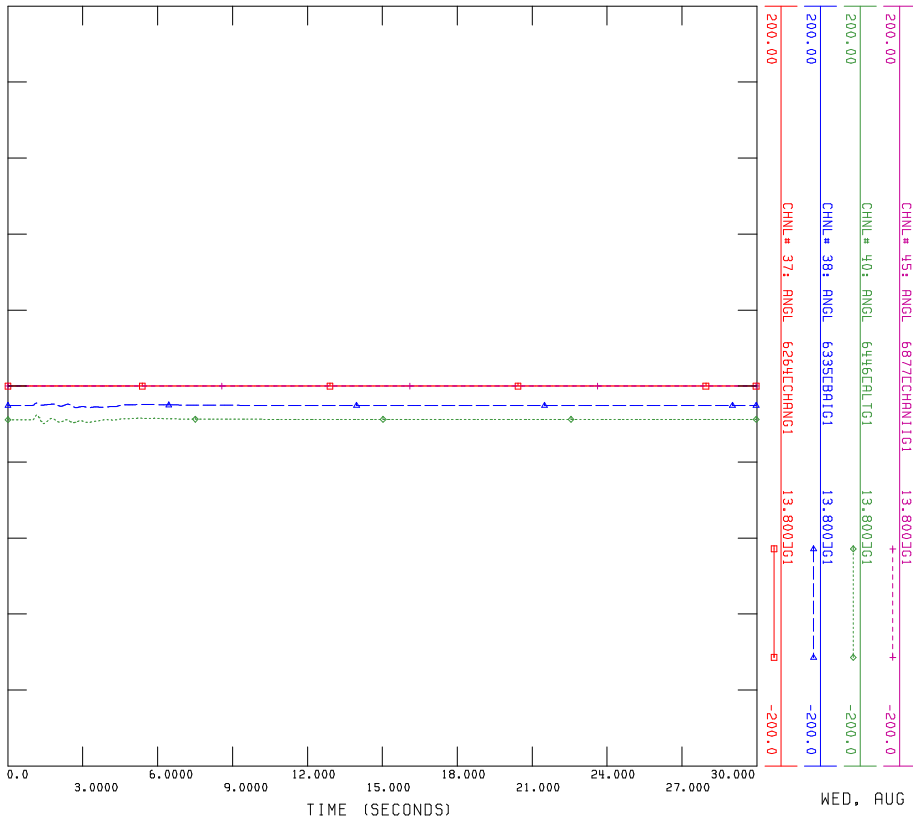


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P020 3FS.  
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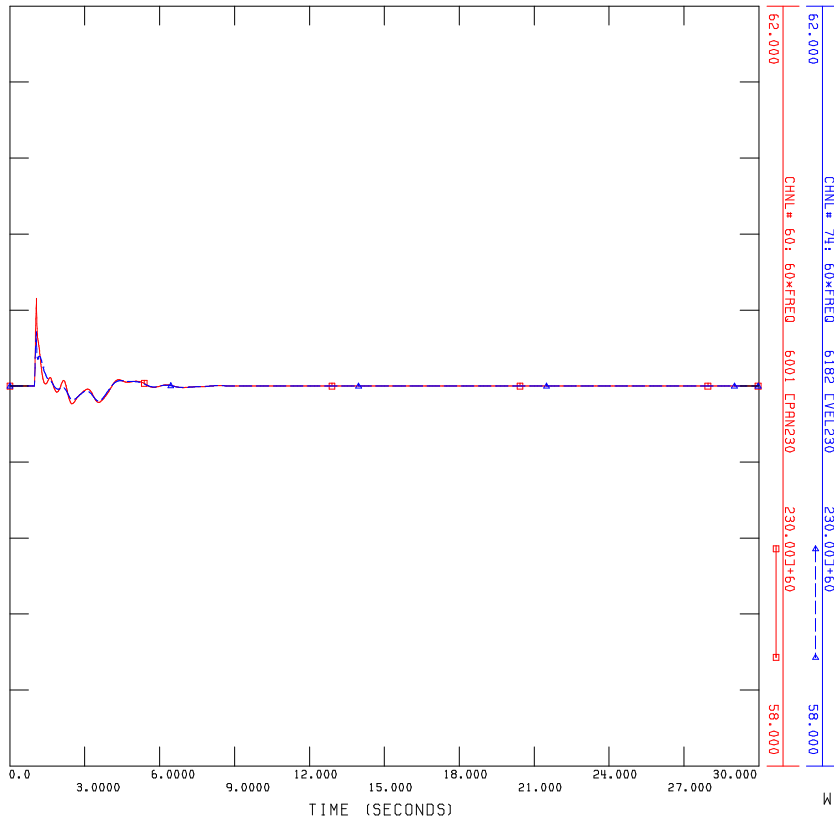


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ESCENARIO 2020CA-MODMAX-SEC - FALLA P020 3FS.  
FRECUENCIAS.

FILE: P020\_3FS\_2020CA-ModMax-Sec.out







**ANEXO III-6**  
**Análisis Dinámico Alternativa 2B**

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## 1. RESULTADO DEL ANÁLISIS DINÁMICO

Las simulaciones dinámicas con el objetivo de evaluar el comportamiento del sistema ante grandes perturbaciones (fallas en líneas principales y pérdida de generadores). Las fallas simuladas se enumeran en la siguiente tabla, junto con los códigos de referencias. En el caso de fallas sobre líneas, se consideraron cortocircuitos trifásicos con apertura definitiva. La duración de las fallas fue de 66 ms.

Código	Tipo	Gen/Línea afectado
P001	Gen	FORTUNA
P002	Gen	BAYANO
P003	Gen	ESTI
P004	Gen	PAMAM
P005	Gen	CHANGUINOLA 2
P006	Gen	GUALACA - GLA
P007	Gen	BAHIA LAS MINAS
P008	Gen	NCH
P009	Gen	COSTA NORTE
P010	Gen	BAHIA LAS MINAS
P011	Gen	PUNTA RINCON
P012	Línea	MDN - VEL
P013	Línea	PAN - PAN II
P014	Línea	ECO - BRG
P015	Línea	LSA - VEL
P016	Línea	LSA - SBA
P017	Línea	LSA - EHI
P018	Línea	CHG - PAN3
P019	Línea	EHI - CHO
P020	Línea	PAN3 - BUR

*Nota 1: sobre las fallas simuladas de Panamá y Bahía las Minas Carbón se implementó un esquema de control suplementario (existente). Los esquemas corresponden a la implementación de desligue de demanda.*

Los escenarios utilizados para las simulaciones son los de máxima demanda correspondientes a la época seca y lluviosa de 2020. En el Anexo se muestran los resultados de las simulaciones. Se exhiben 6 gráficos por falla, en los que se muestran las siguientes variables:

- Voltaje en las principales barras de 230 kV: El Coco, Veladero, Mata de Nance, Llano Sánchez, Chorrera, Panamá.
- Voltaje en las principales barras de 115 kV: Panamá, Panamá II, Llano Sánchez, Cáceres, Santa Rita, Mata de Nance.
- Ángulos relativos de las máquinas térmicas: Bahía Las Minas Carbón (6071), Panam (6108), Punta Rincón (6756), Costa Norte (6804), Bahía Las Minas Gas (6748).





- Ángulos relativos de las máquinas hidráulicas: Estí (6176), Bayano (6101), Fortuna (6507), La Estrella (6090), Changuinola 1 (6264), El Alto (6446), Changuinola 2 (6877), Baitun (6335).
- Frecuencia de Panamá y de Veladero.

En todos los casos se observa un comportamiento estable. La recuperación de las tensiones es efectiva y las excursiones angulares se mantienen dentro de valores aceptables.

Asimismo, la frecuencia no presenta grandes desviaciones.

Para cada falla, se representan 6 gráficos según se indica a continuación:

**Gráfico 1: Tensiones en 230 Kv**

EL COCO - 6460  
 VELADERO - 6182  
 MATA DE NANCE - 6011  
 LLANO SANCHEZ - 6008  
 LA CHORRERA - 6005  
 PANAMA - 6001

**Gráfico 2: Tensiones en 115 Kv**

MATA DE NANCE - 6012  
 SANTA RITA - 6173  
 CACERES - 6018  
 LLANO SANCHEZ - 6009  
 PANAMA - 6002  
 PANAMA II - 6004

**Gráfico 3: Ángulos en generadores térmicos**

COSTA NORTE  
 PUNTA RINCON  
 BAHIA LAS MINAS GAS  
 PANAM  
 MARTANO

**Gráfico 4: Ángulos en generadores hidráulicos 1**

ESTI  
 BAYANO  
 FORTUNA  
 LA ESTRELLA

**Gráfico 5: Ángulos en generadores hidráulicos 2**

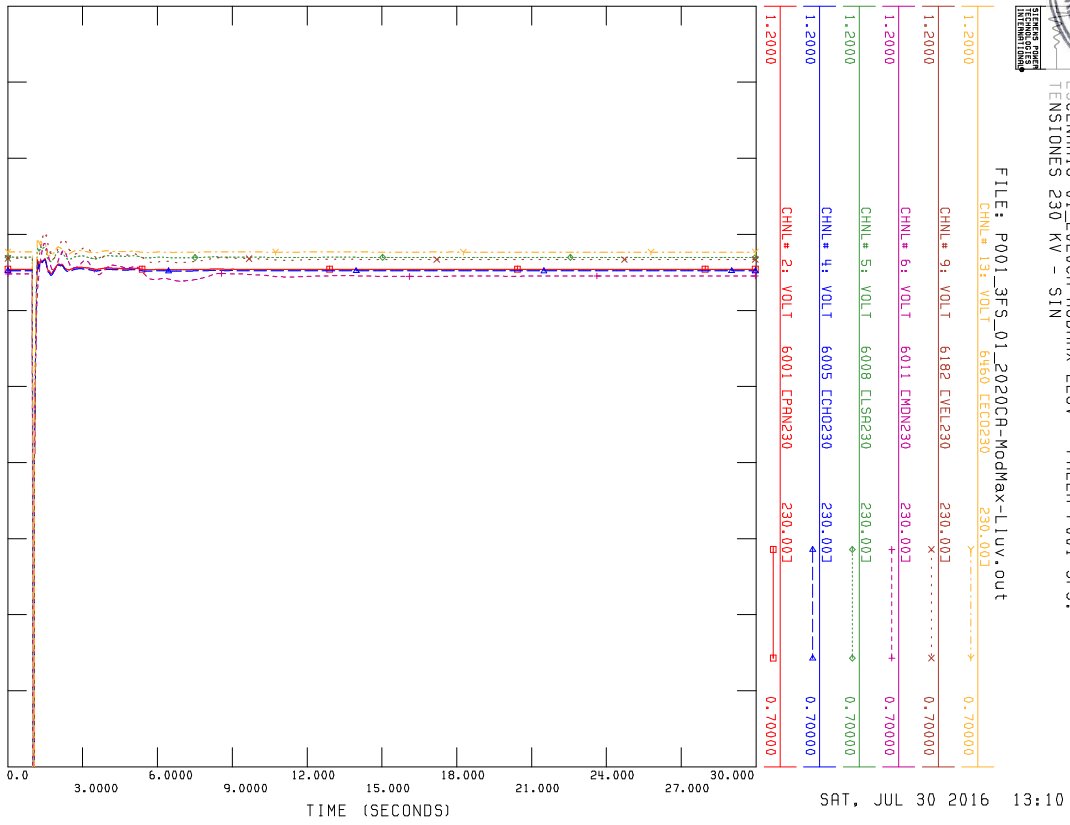
CHANGUINOLA 2  
 CHANGUINOLA 1  
 EL ALTO  
 BAITUN

**Gráfico 6: Frecuencia**

PANAMÁ - 6001  
 VELADERO - 6182

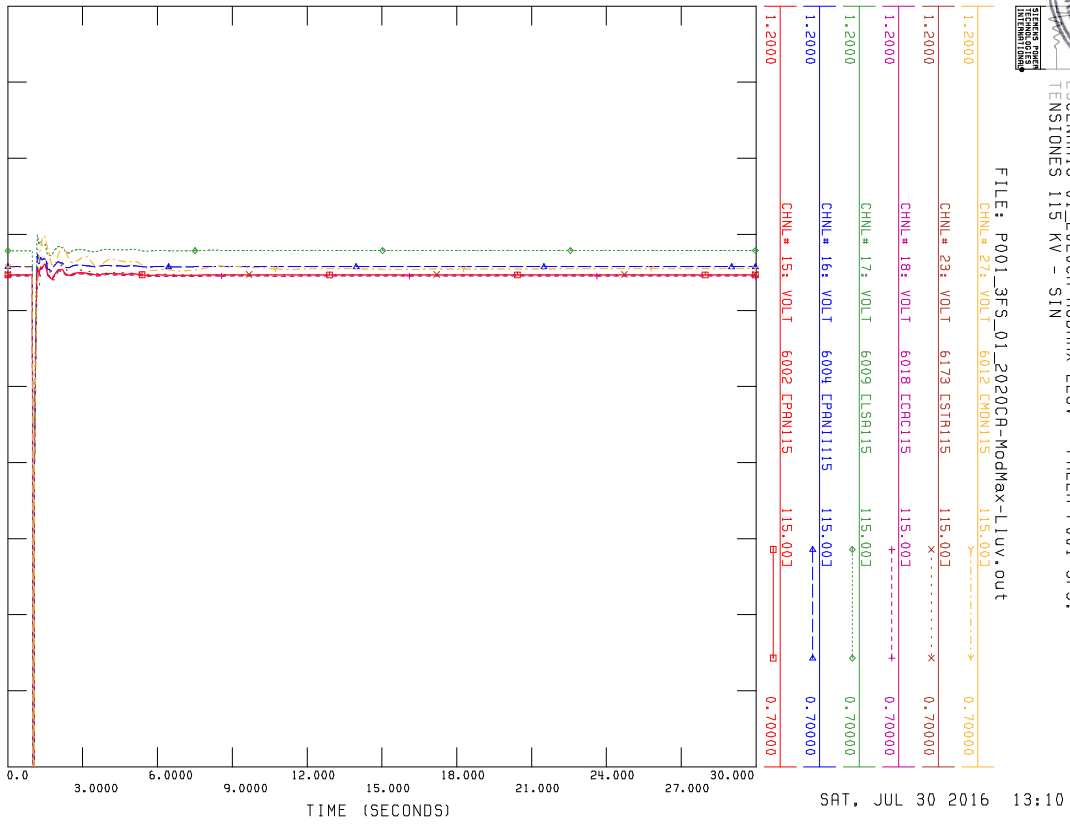


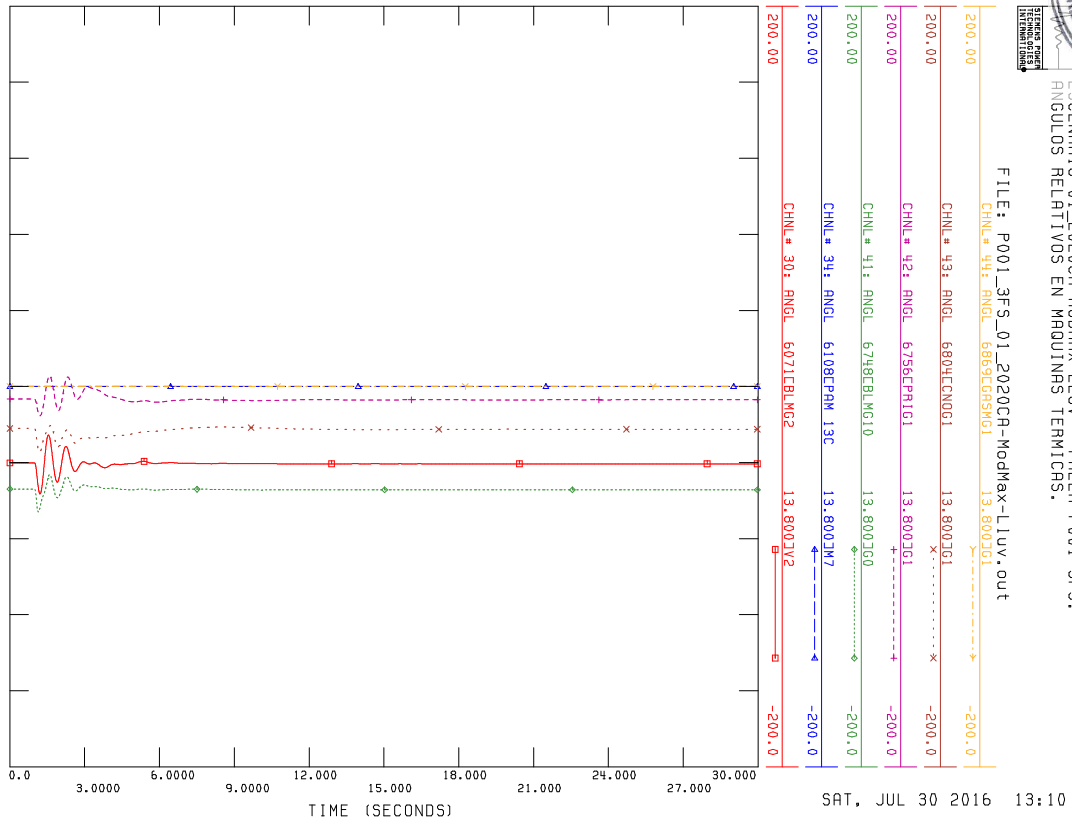
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TENSIONES 230 KV - SIN





ESCENARIO 01\_2020CR-MODMAX-LLUV - FALLA P001 3FS.  
TENSIONES 115 KV - SIN

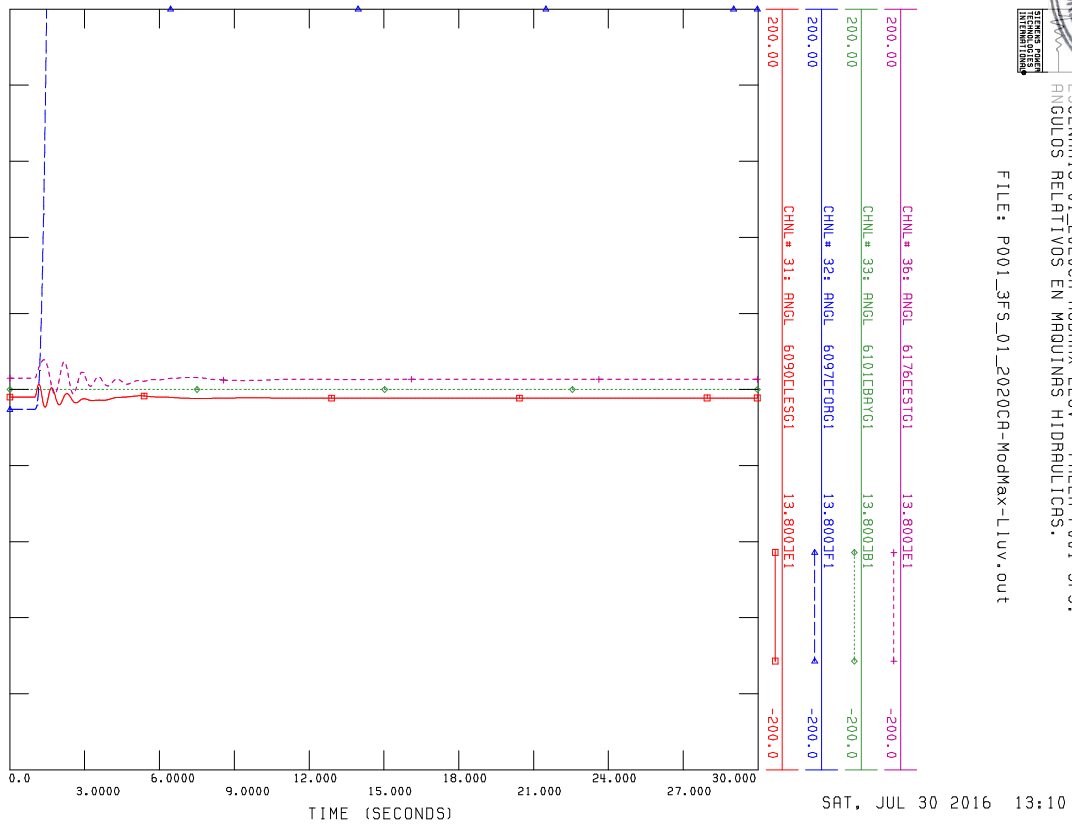






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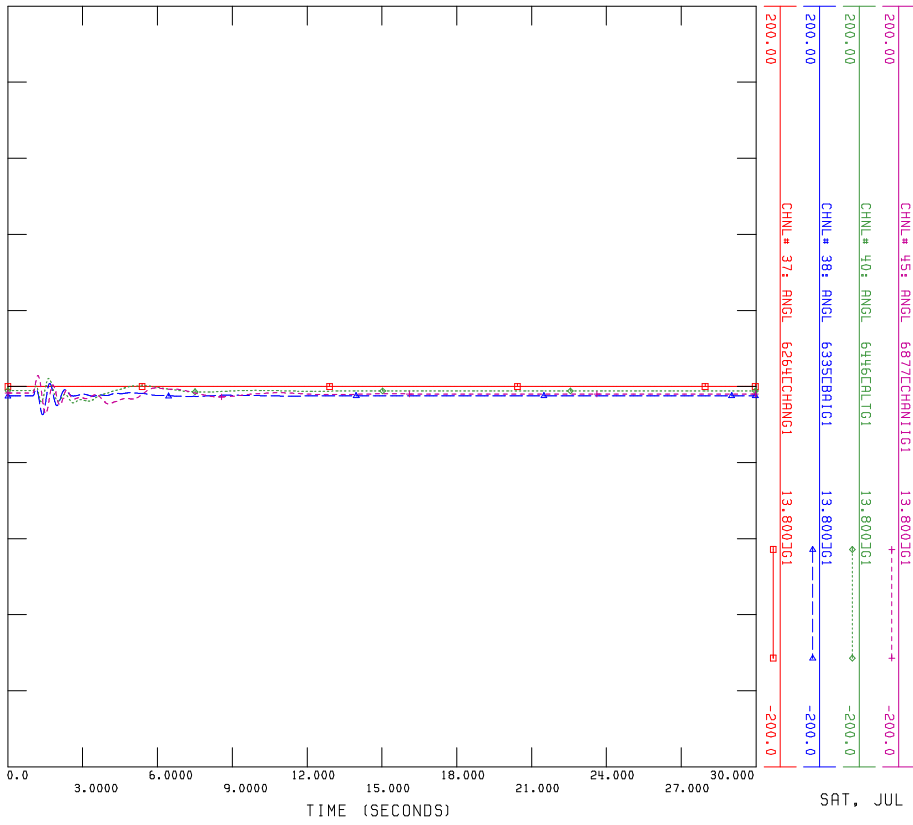
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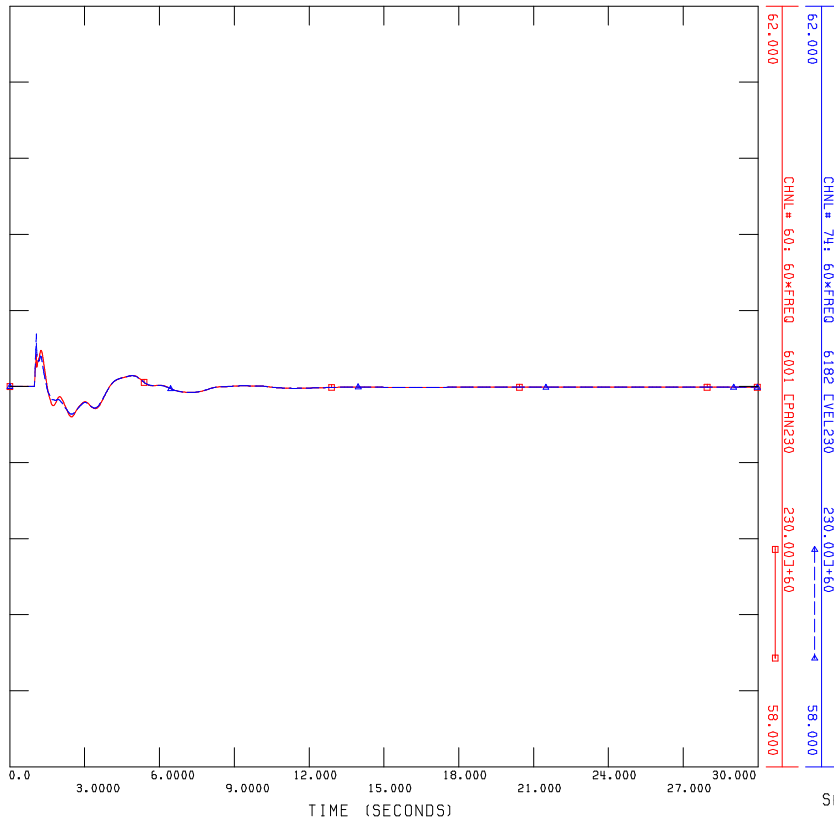
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FRECUENCIAS.

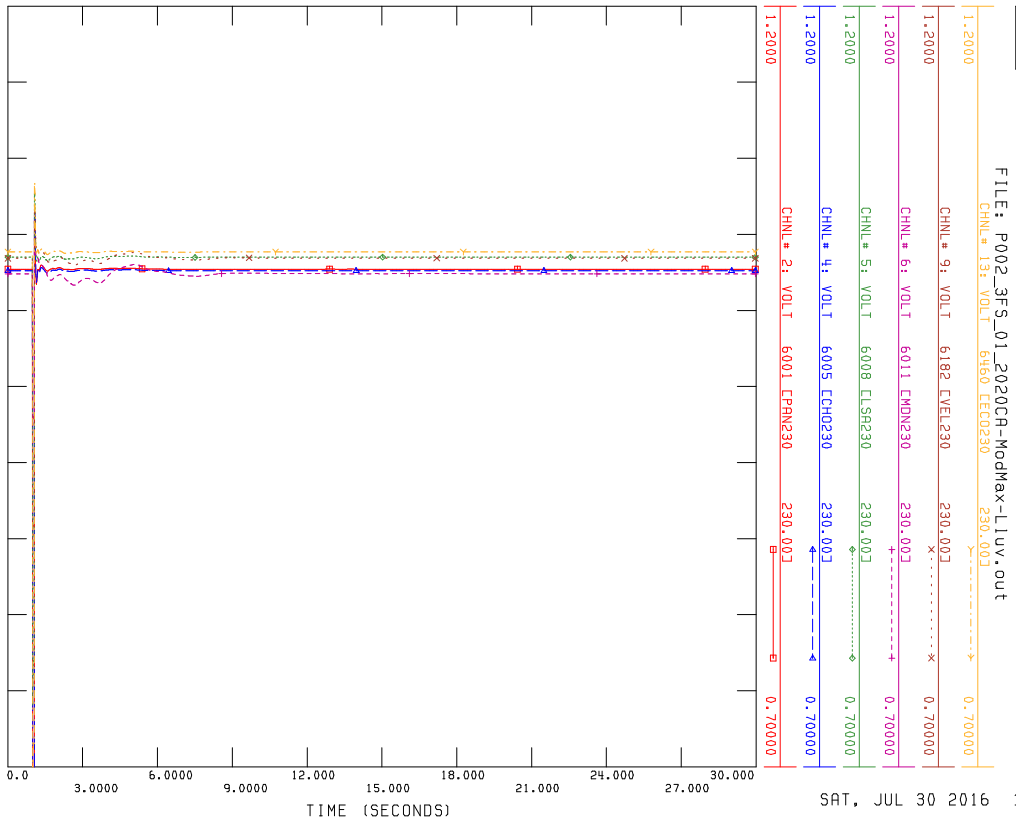
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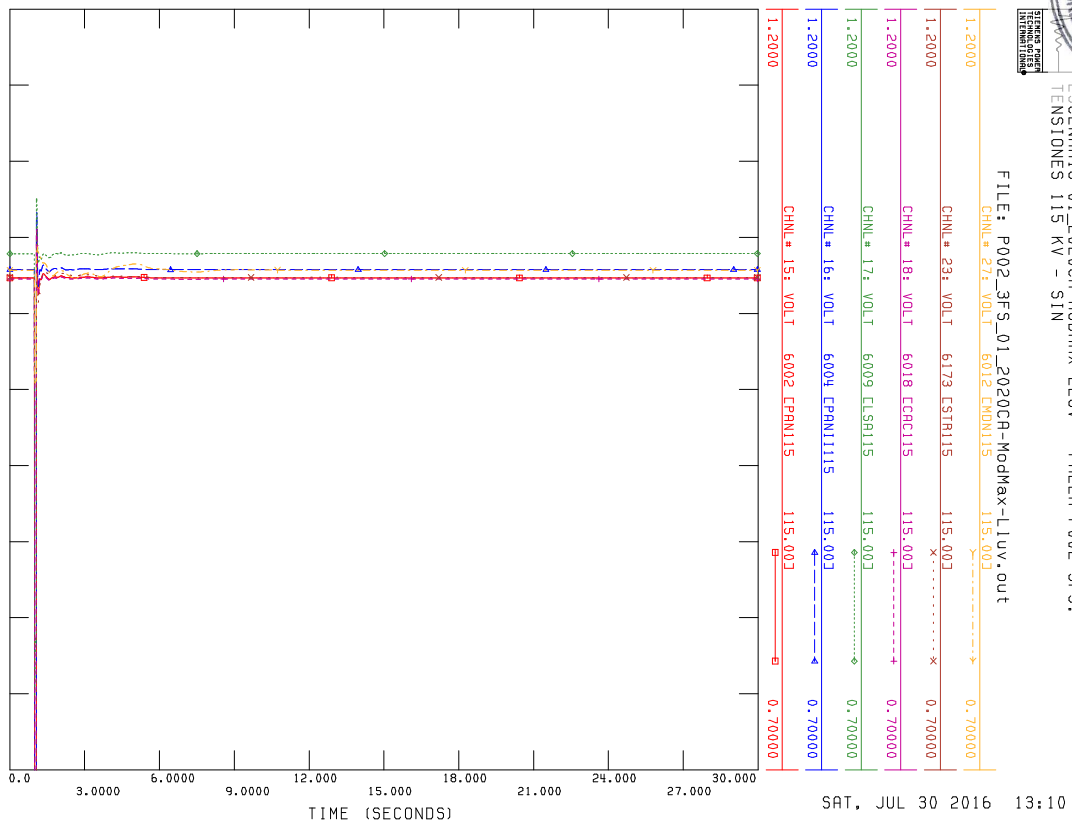
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TENSIONES 230 KV - SIN

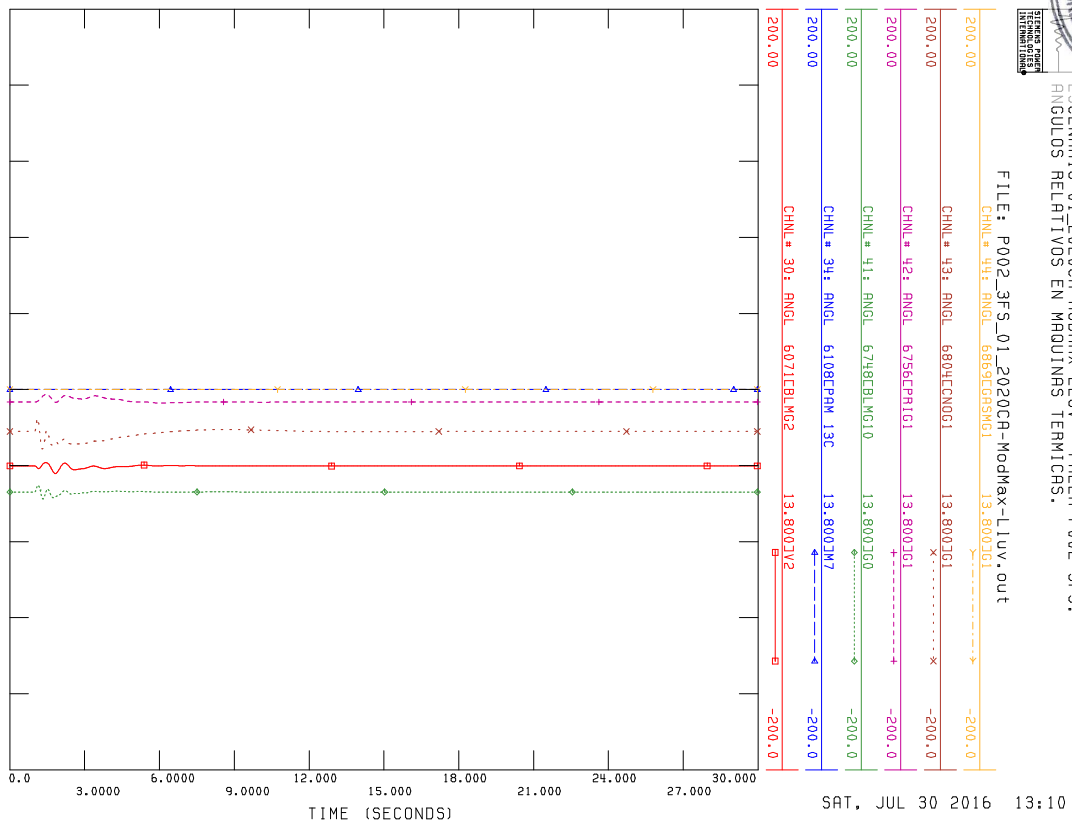






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TENSIONES 115 KV - SIN

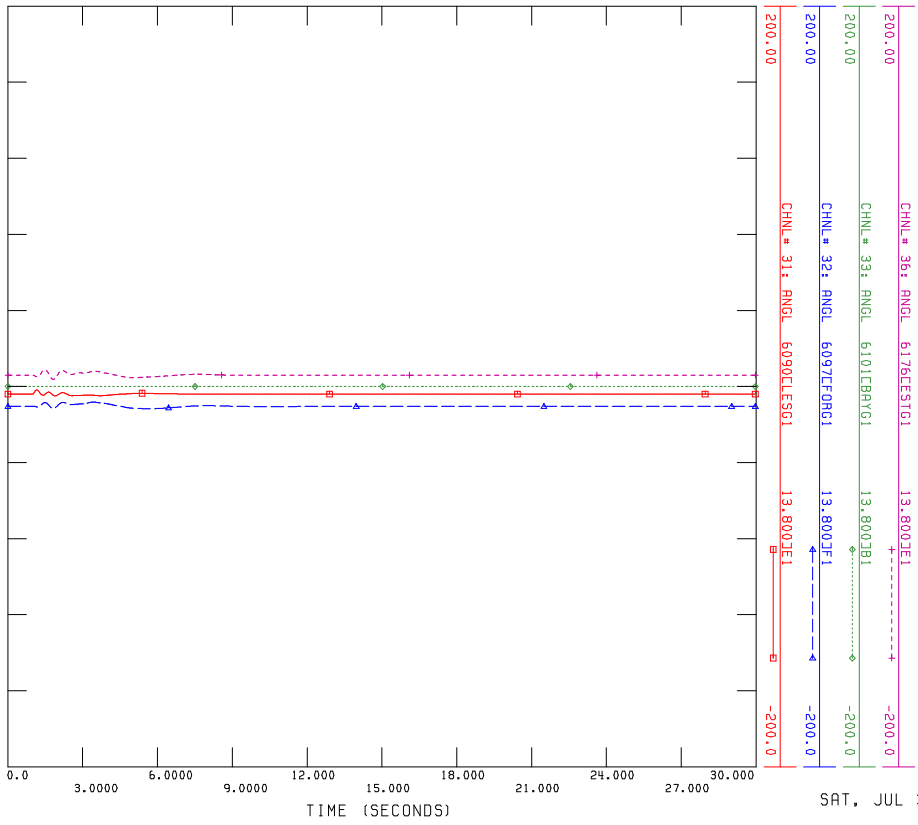






ES  
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 EN  
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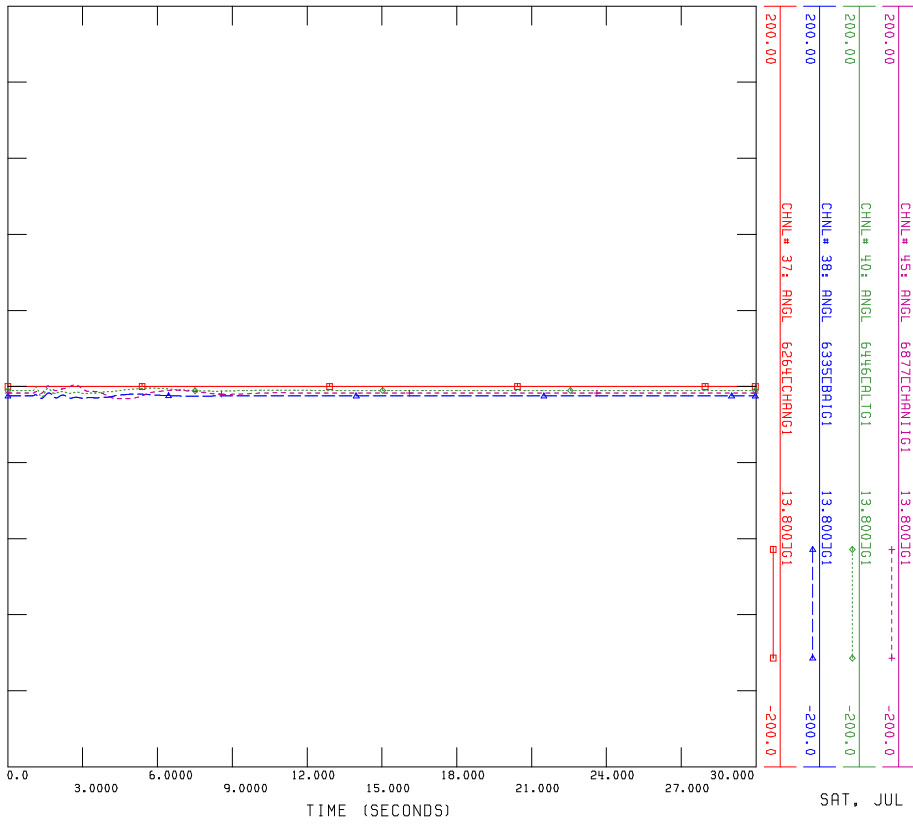


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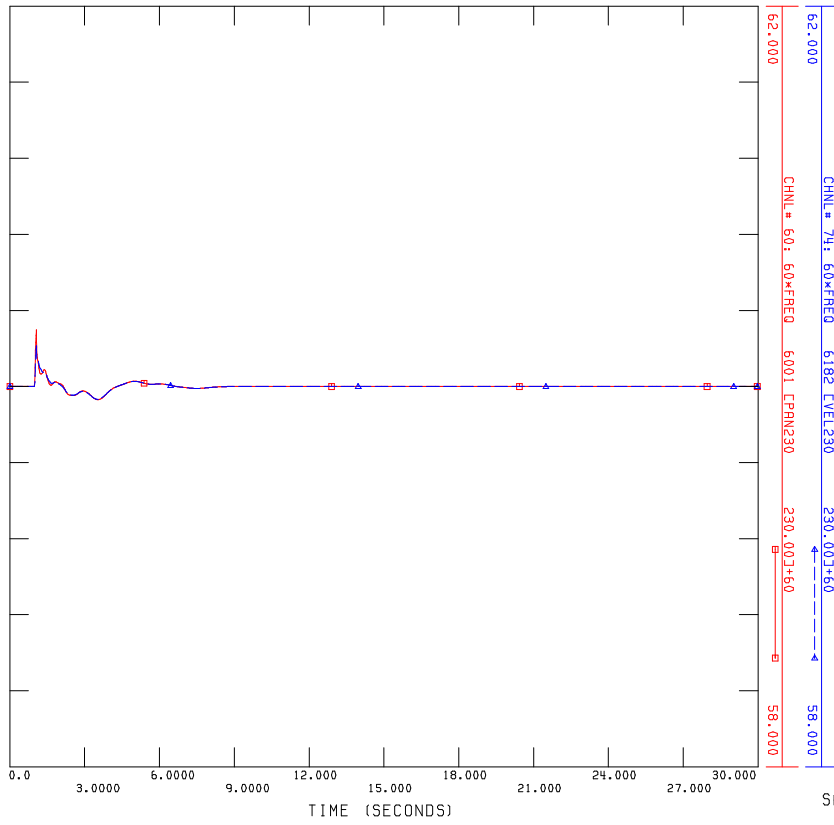
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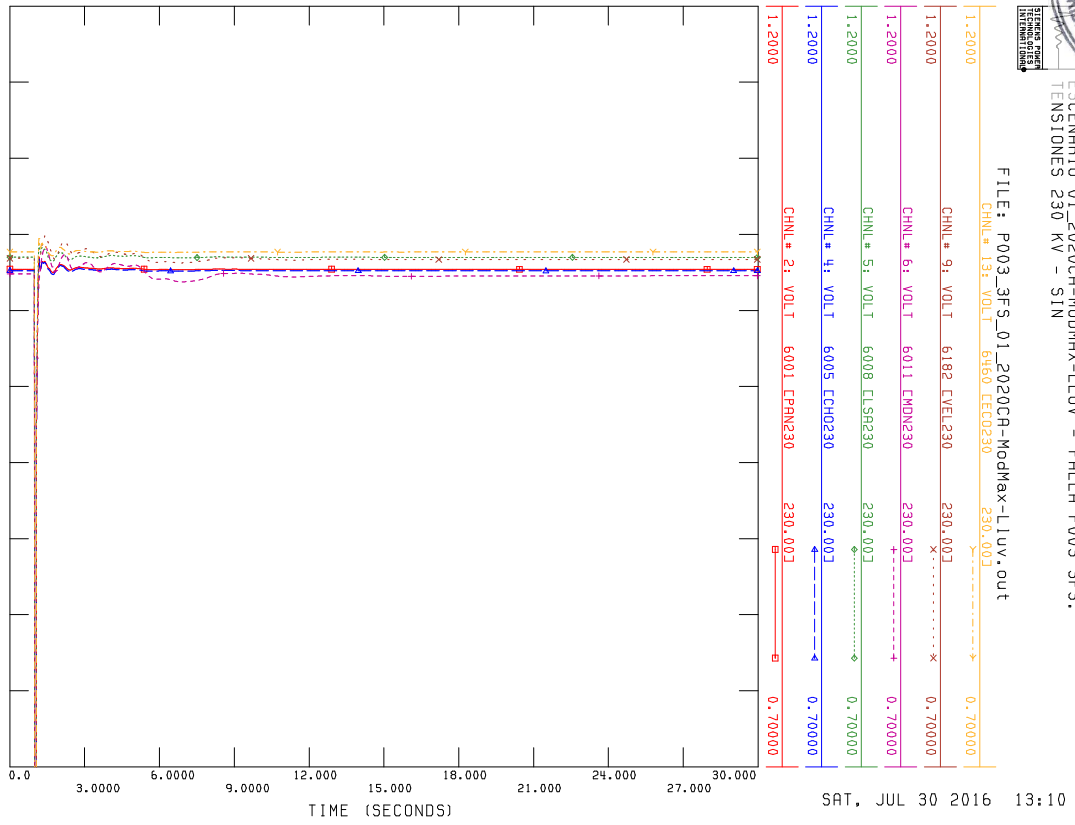


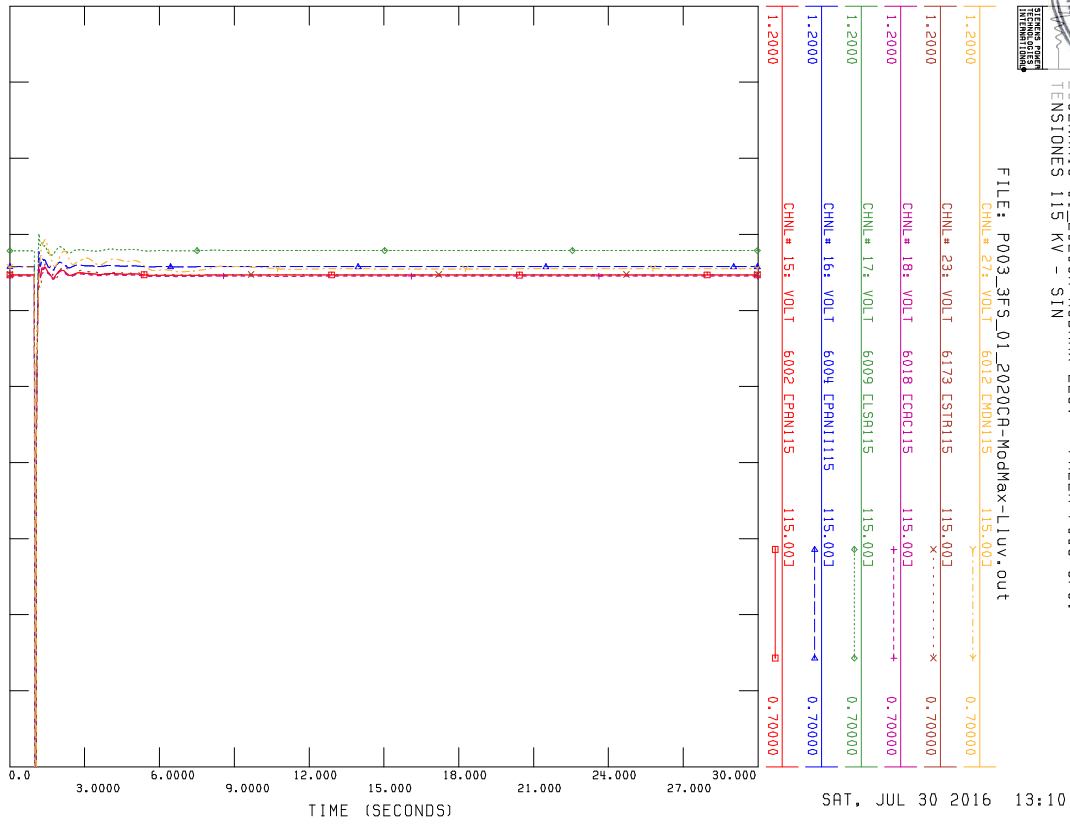
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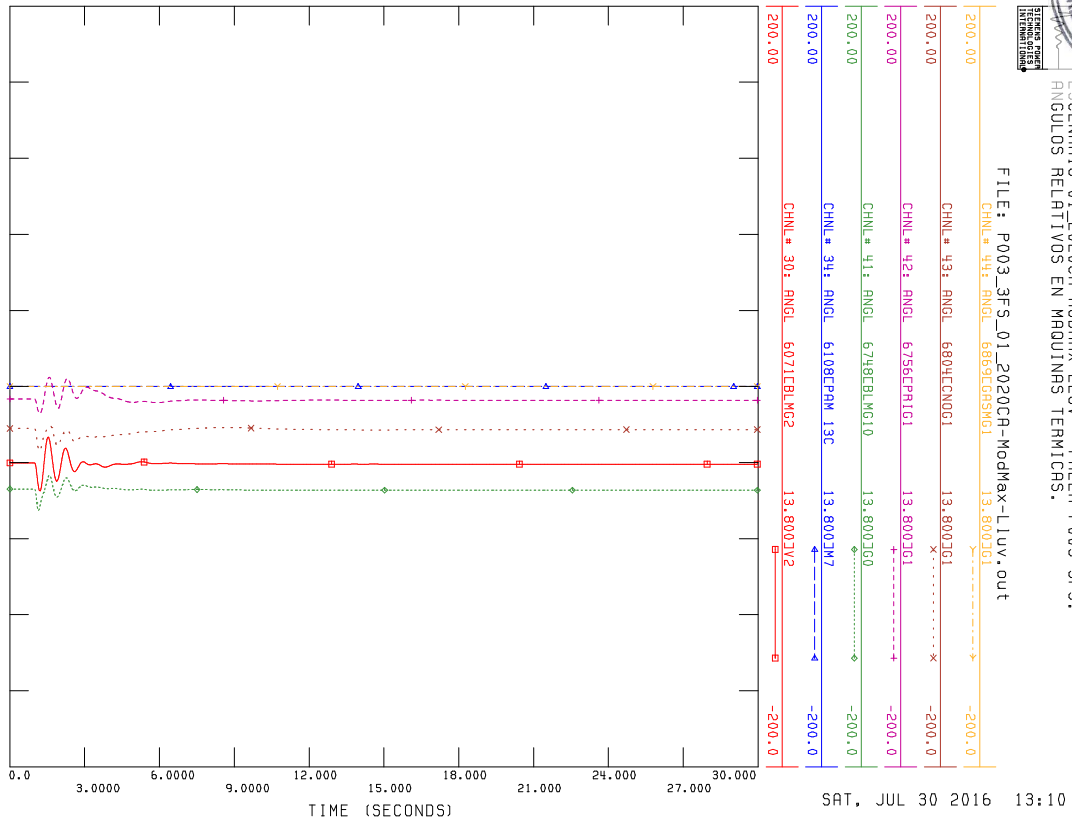
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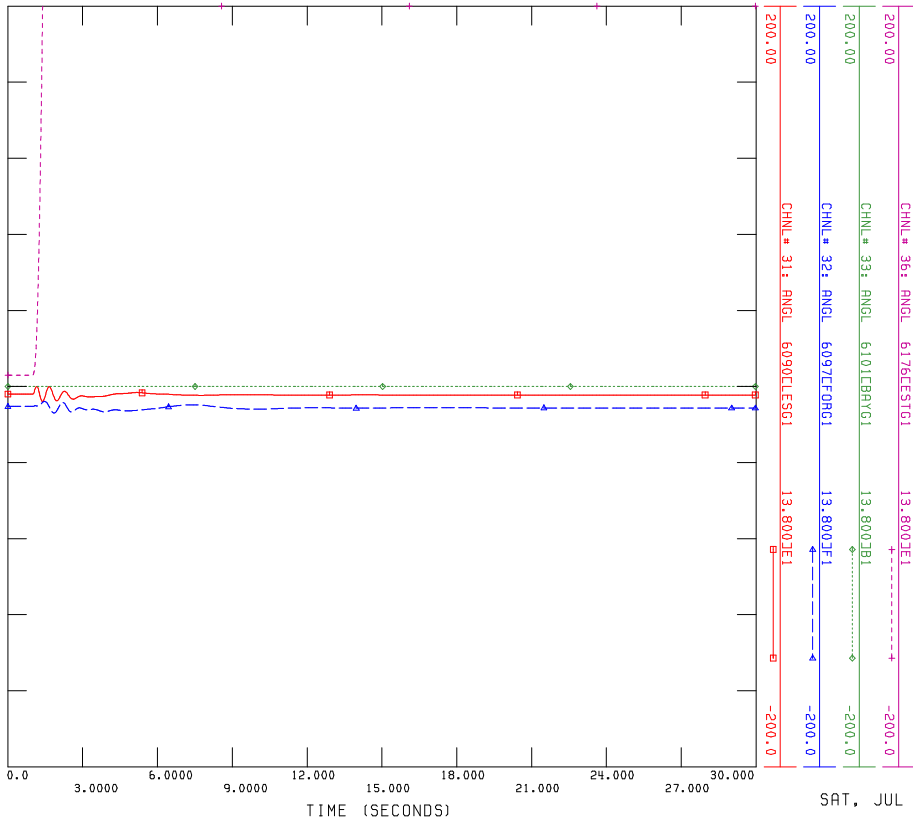






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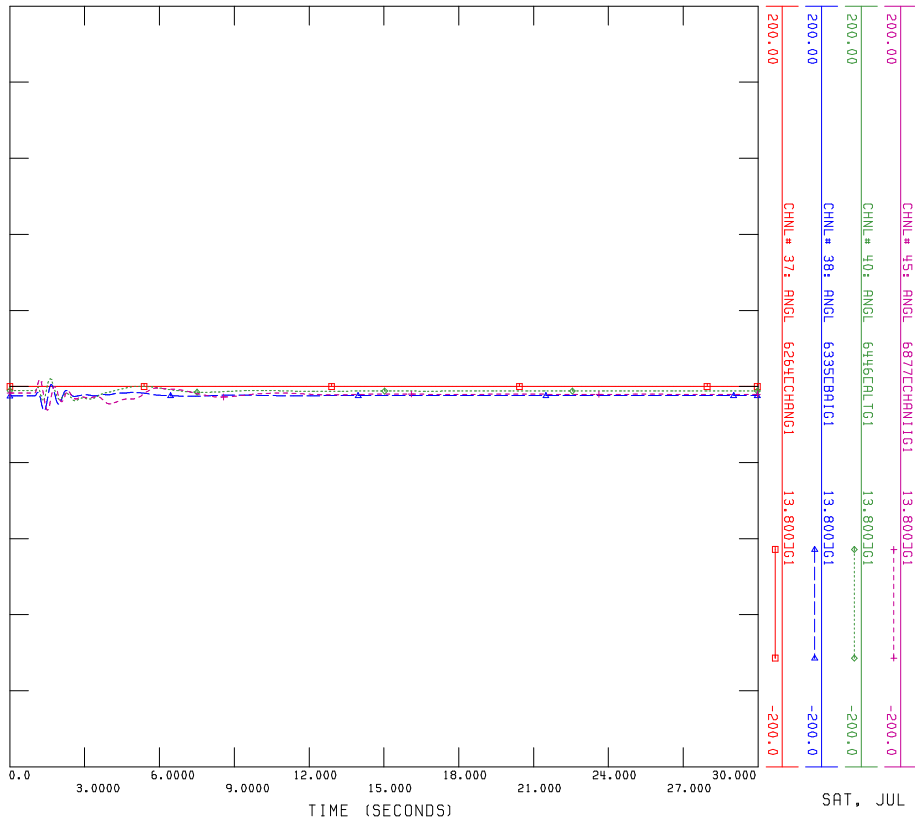


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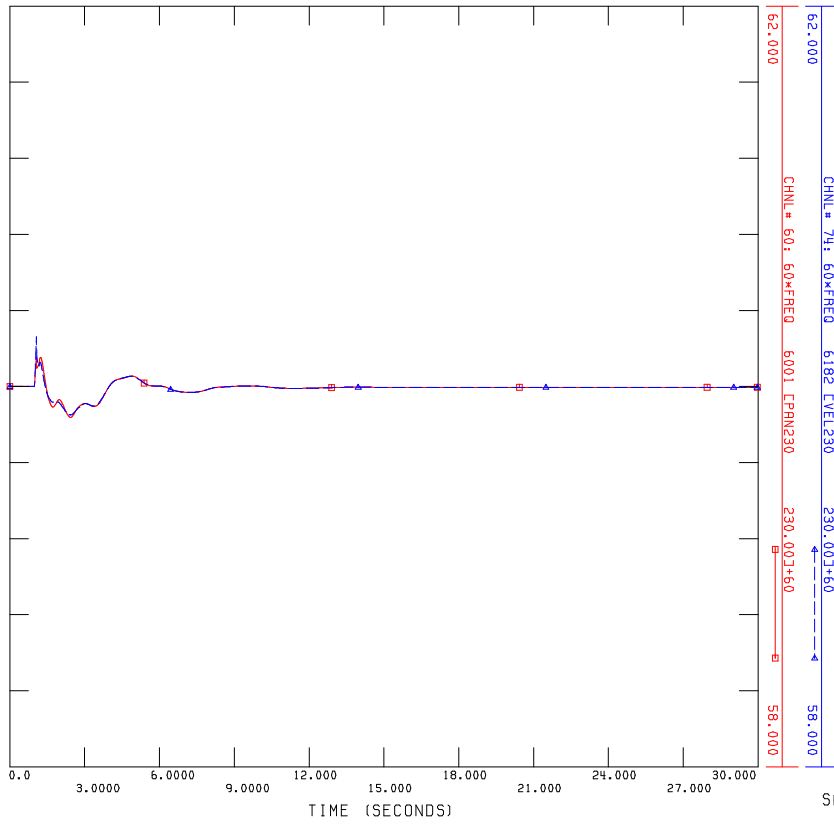
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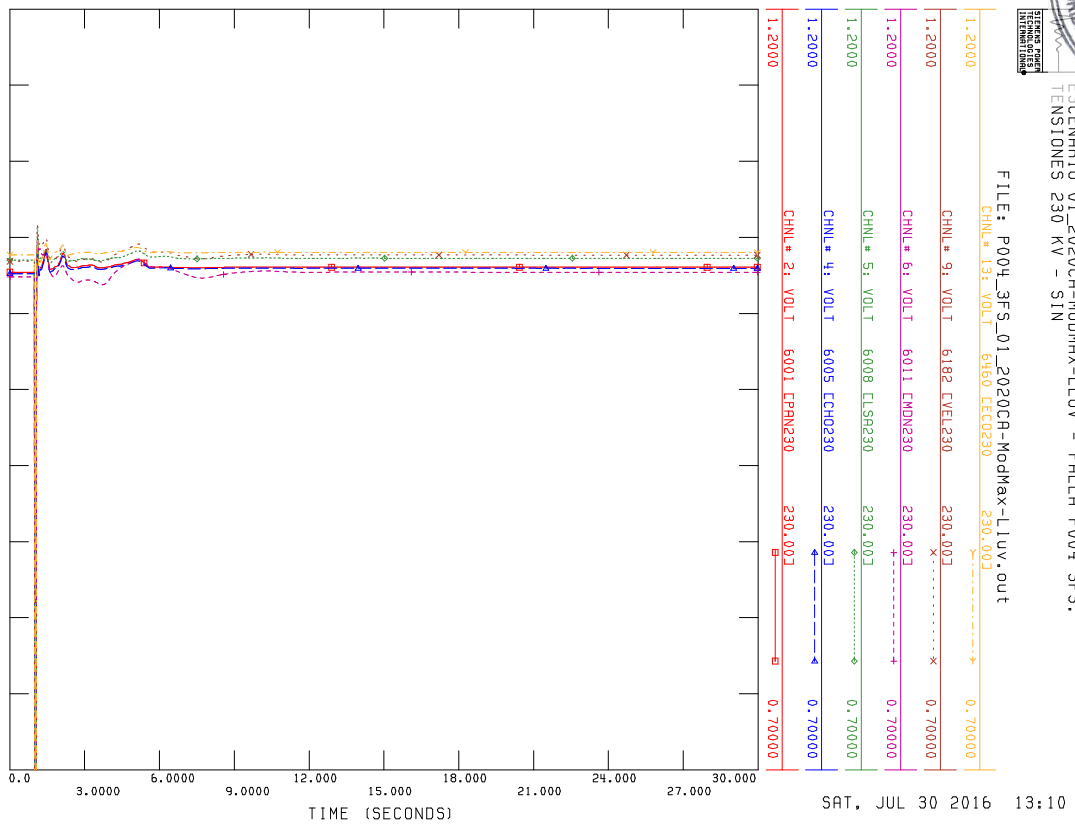
REPUBLICA DE PANAMA  
AUTORIDAD NACIONAL DE LOS SERVICIOS PÚBLICOS

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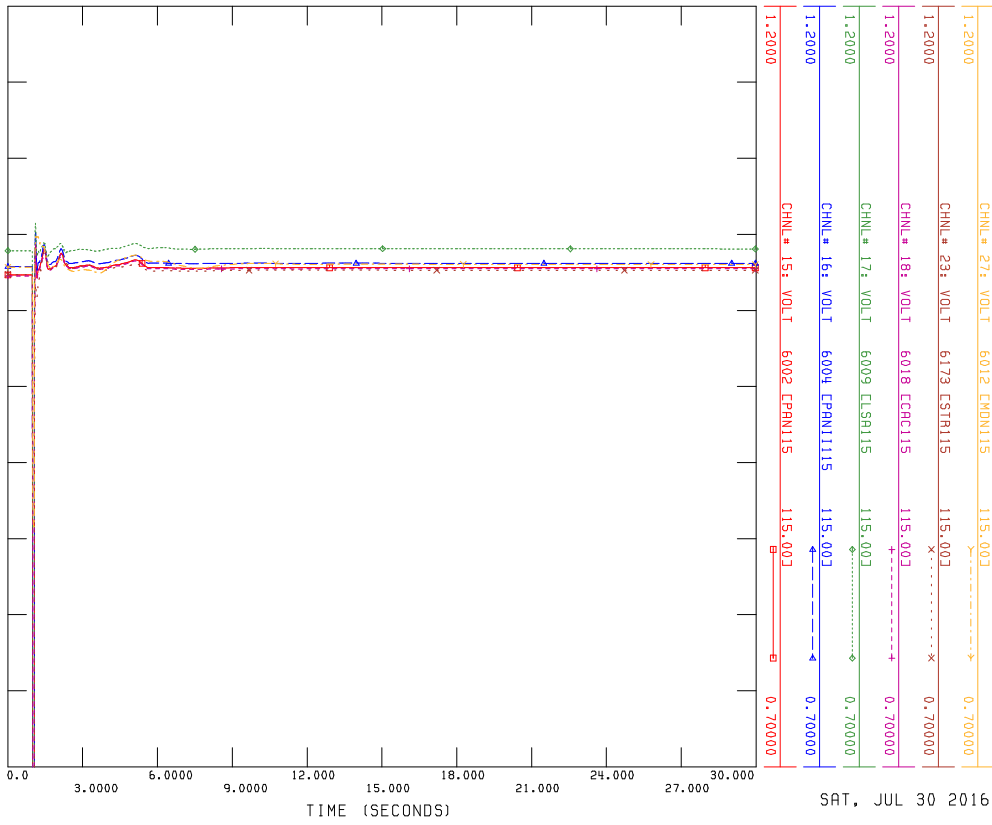




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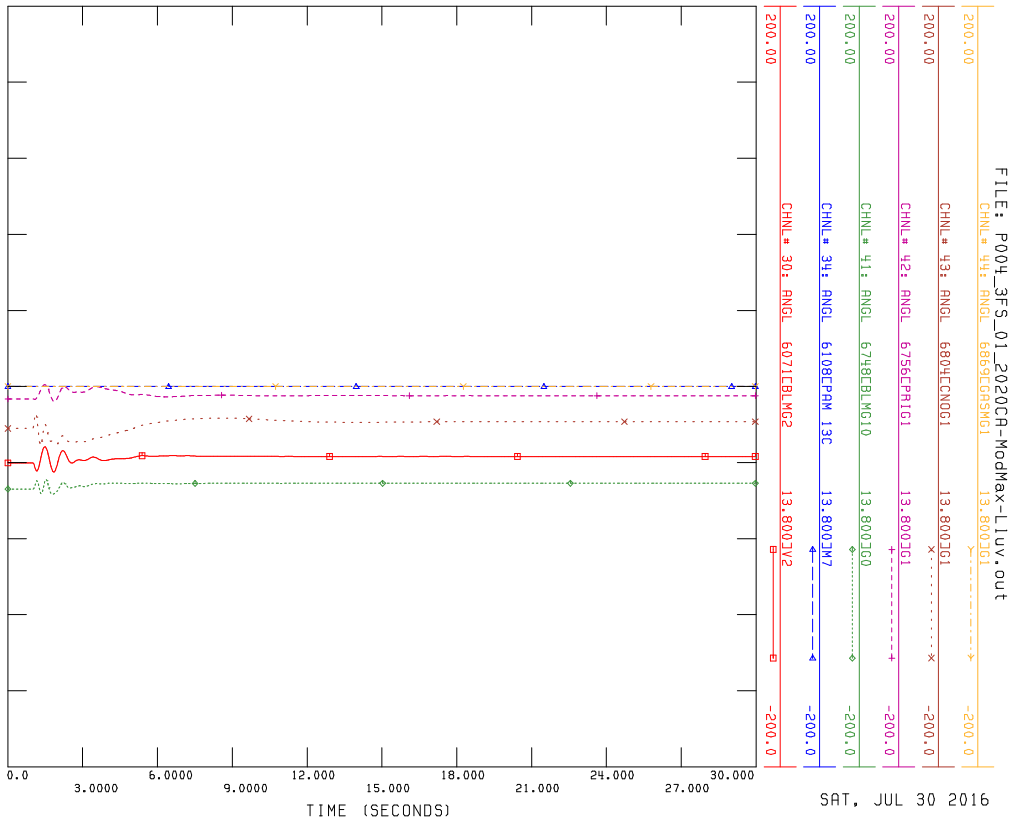
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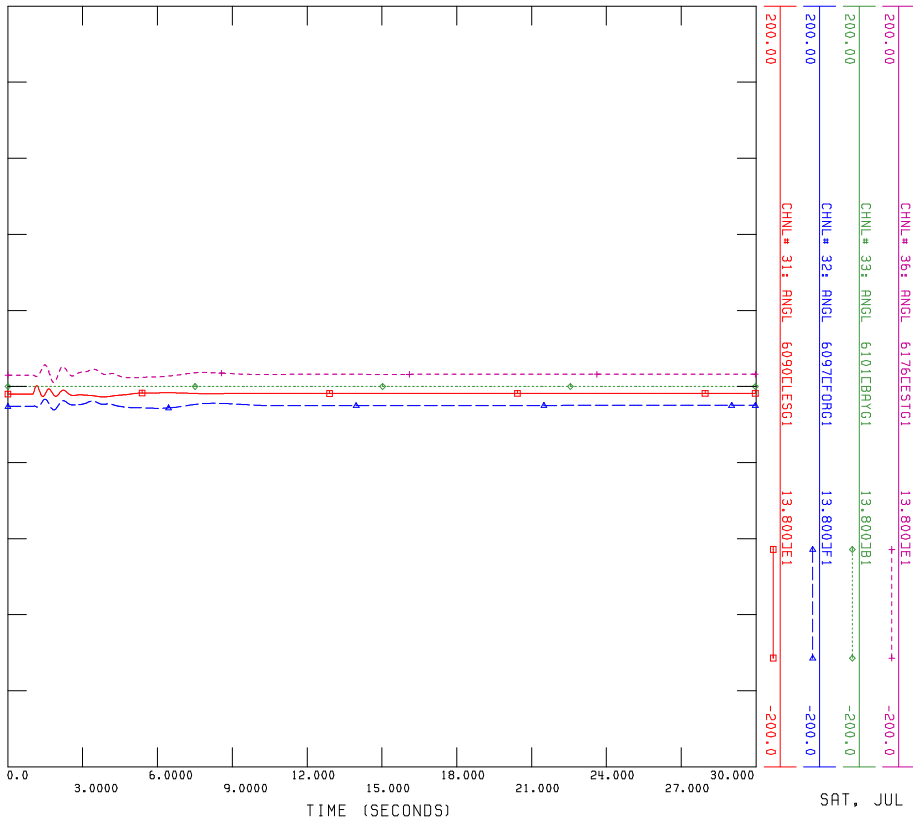
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 ANGULOS RELATIVOS EN MOJUNRS TERMICAS.





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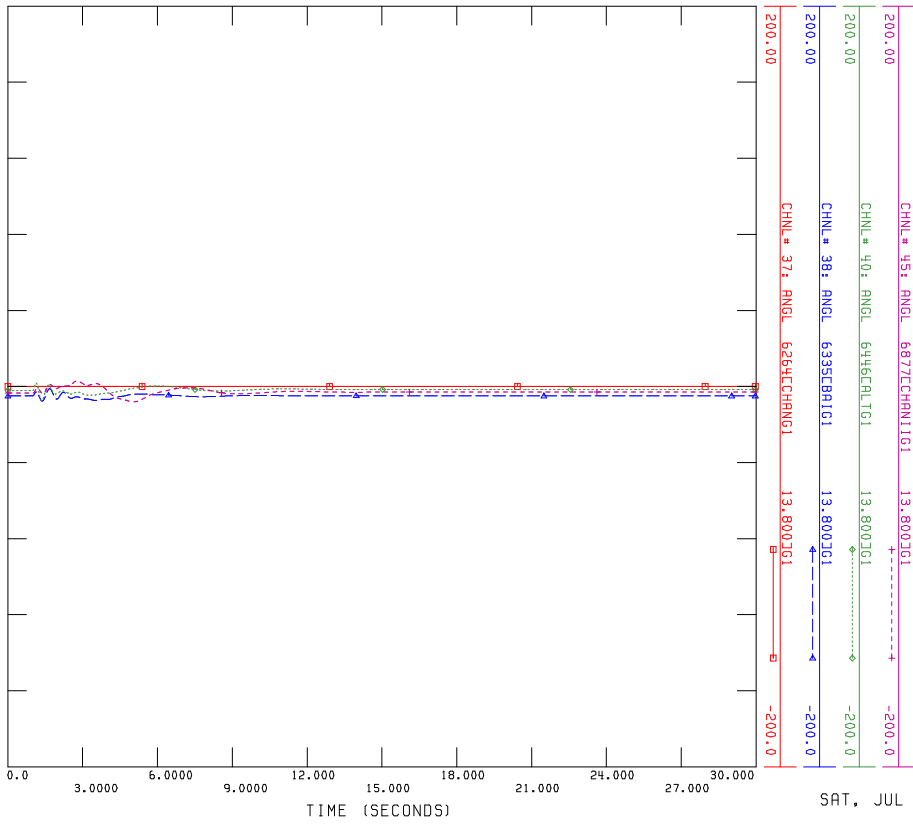


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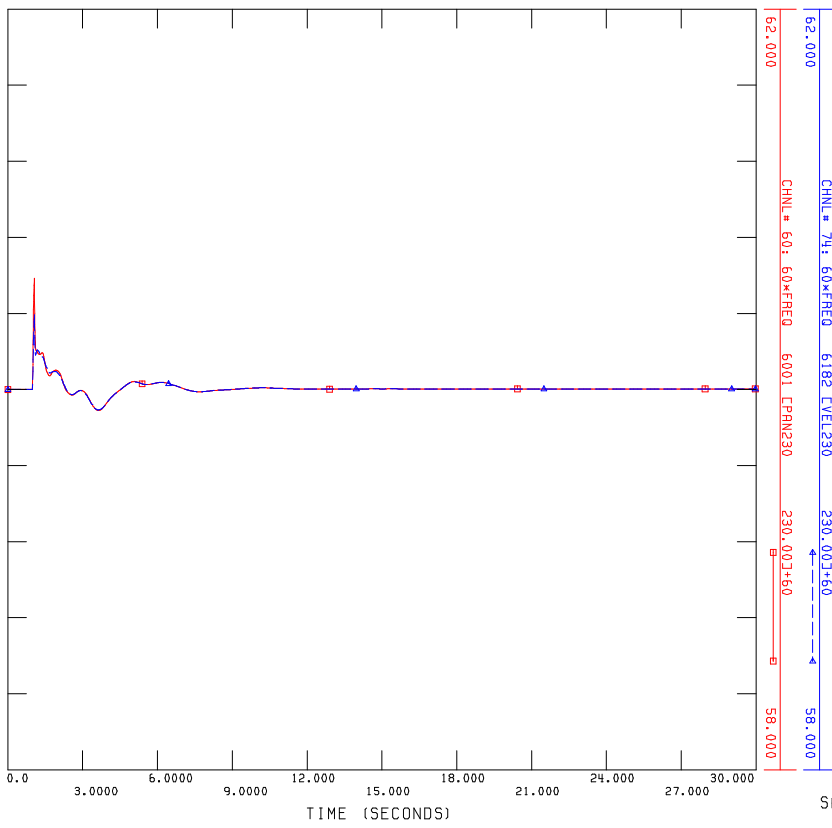
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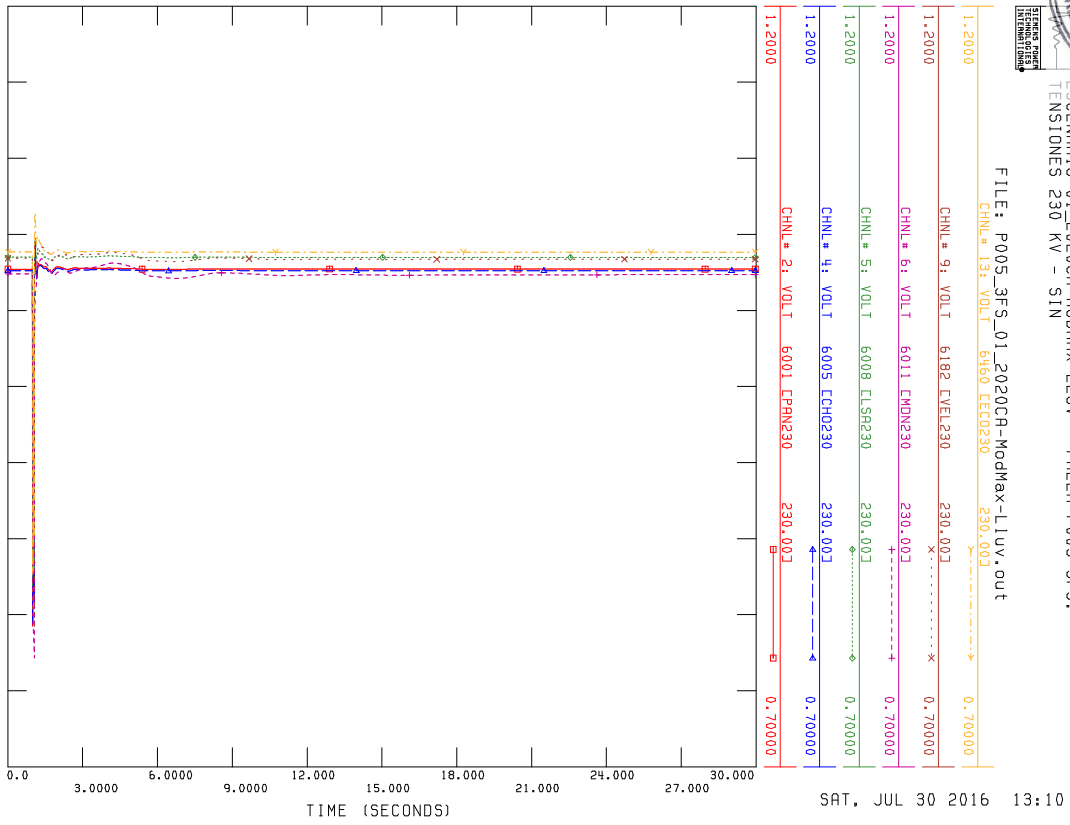
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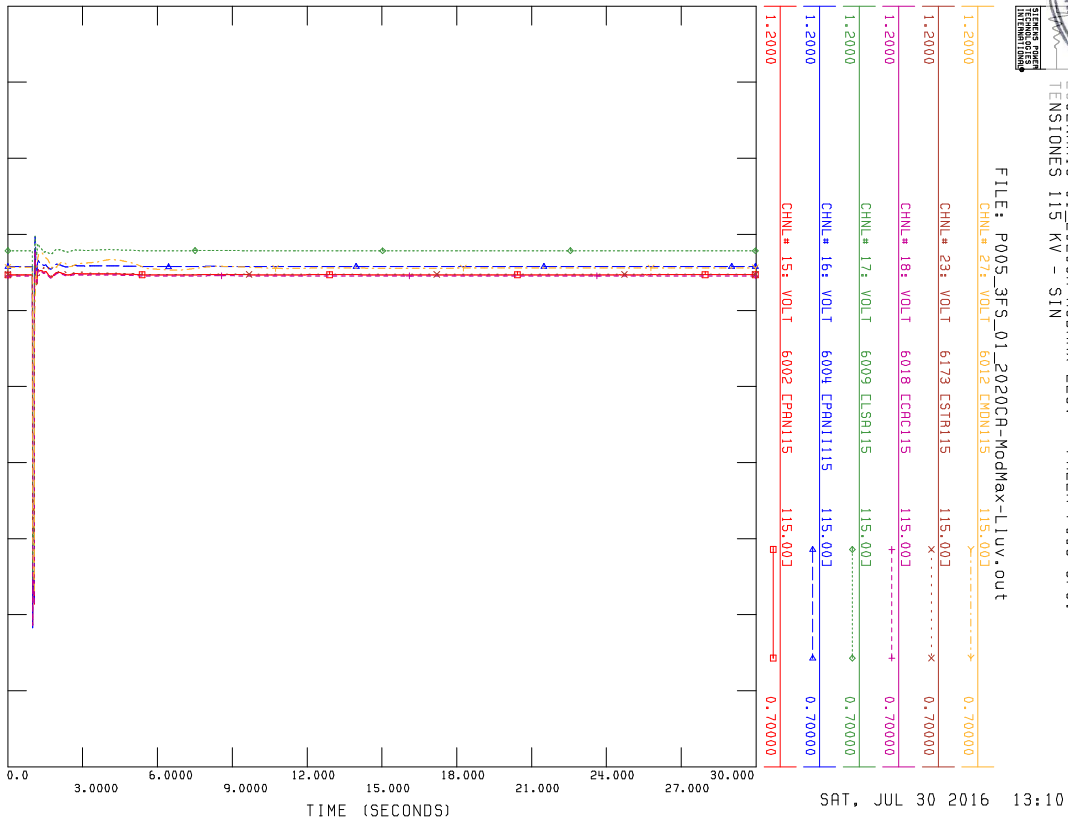


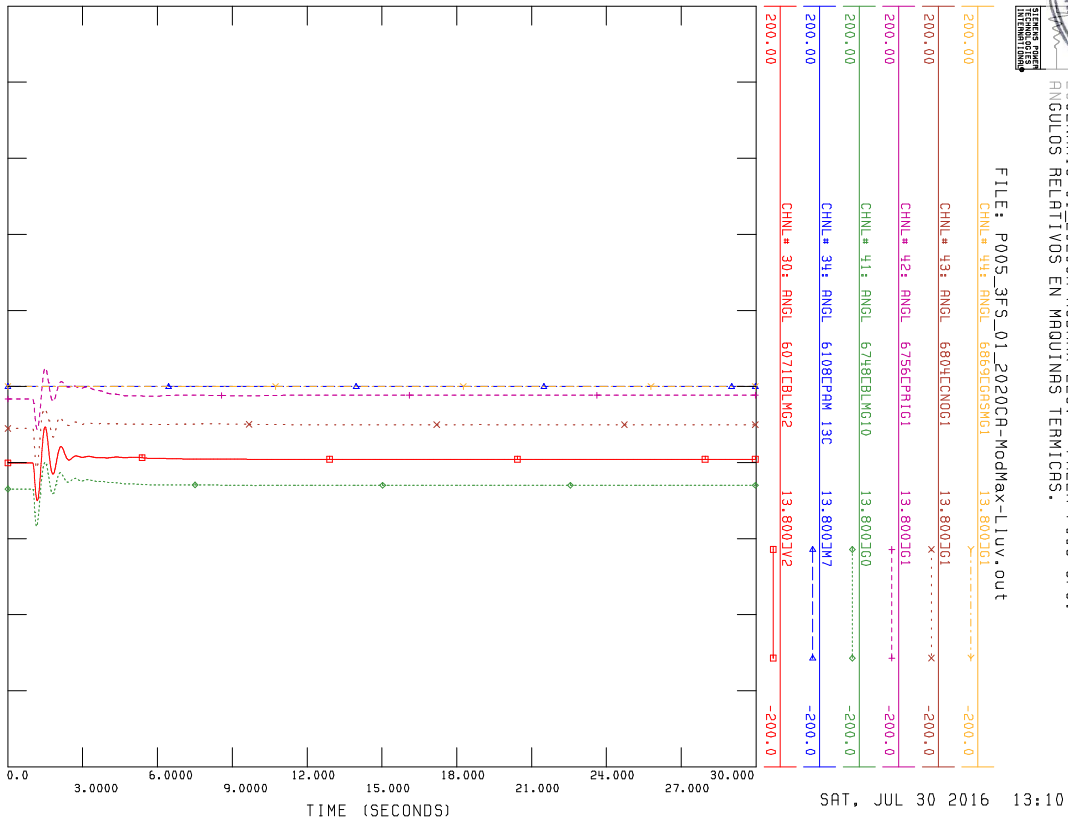
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TENSIONES 230 KV - SIN





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TENSIONES 115 KV - SIN

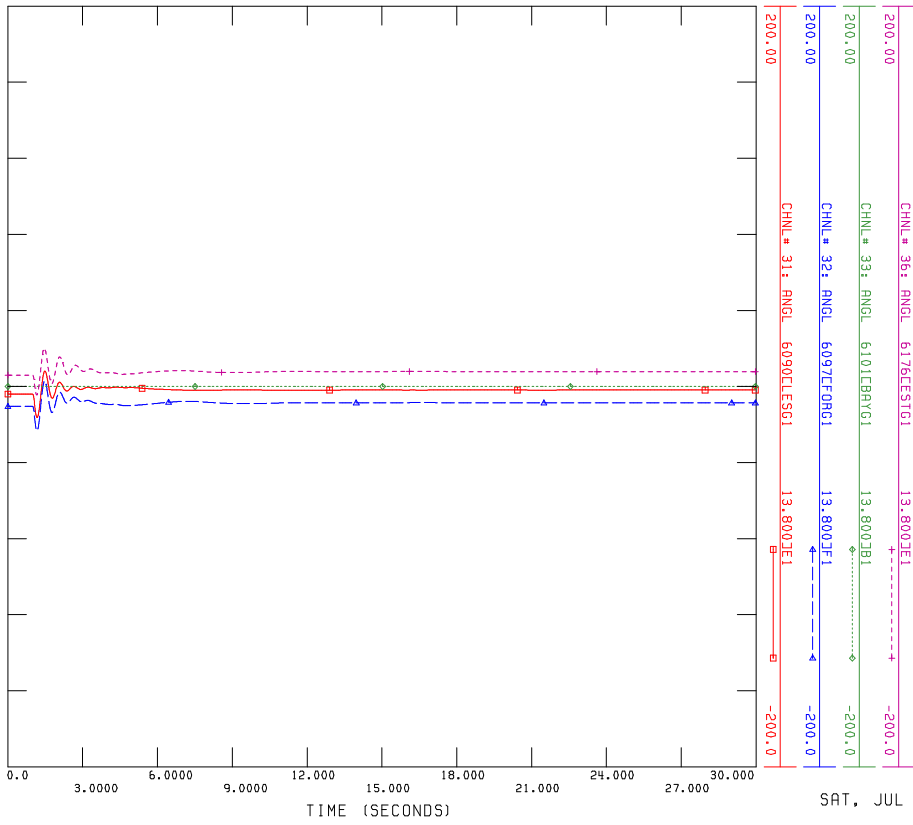






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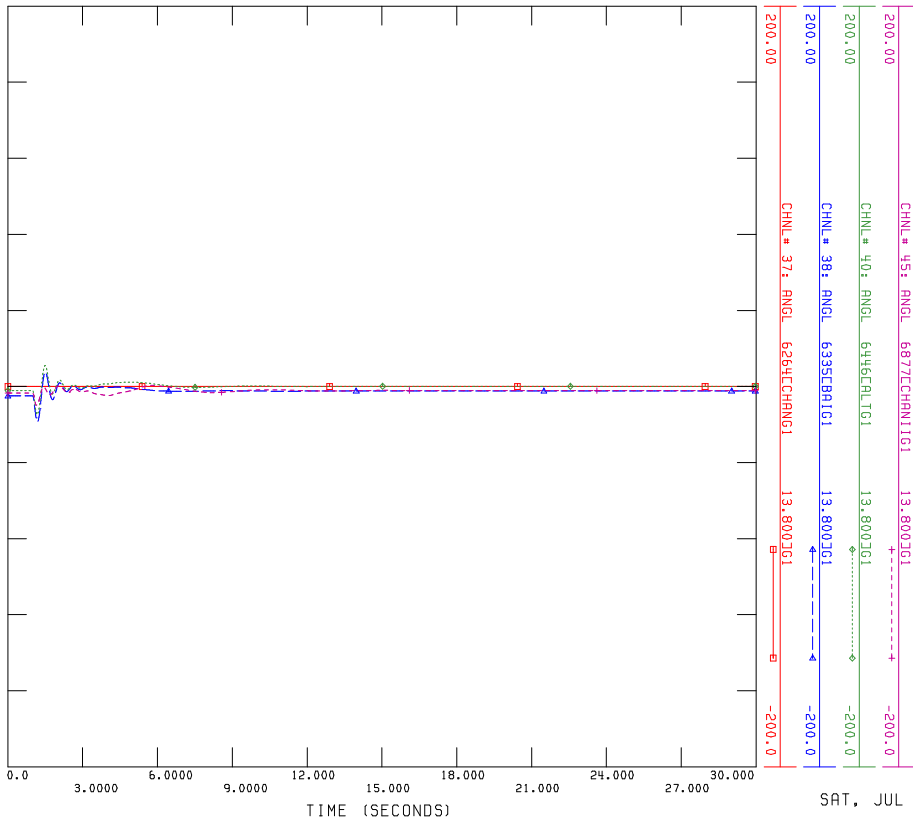


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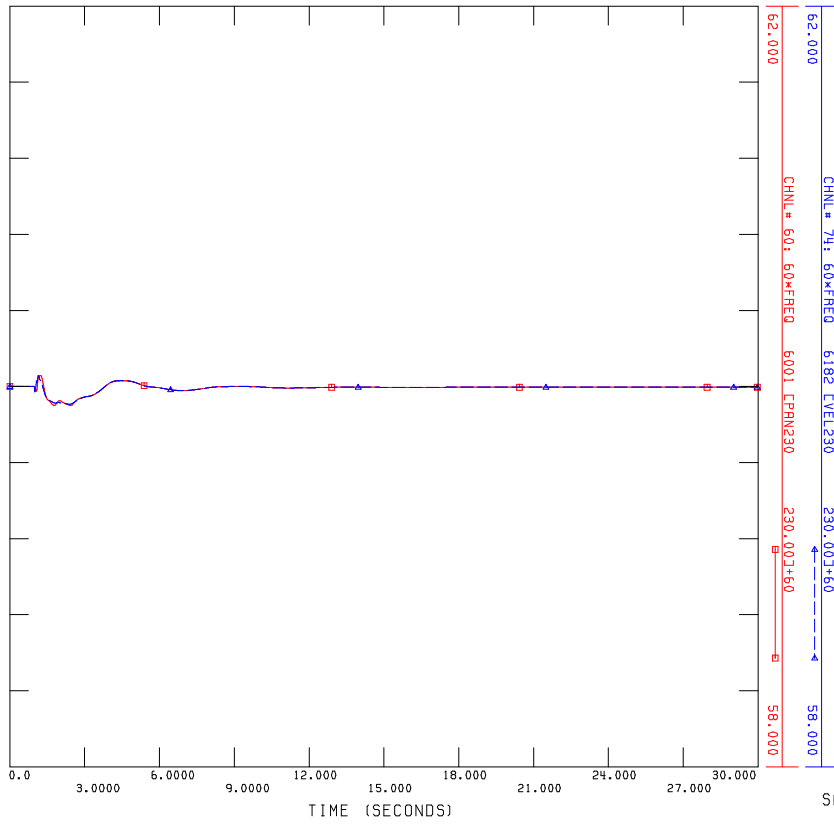
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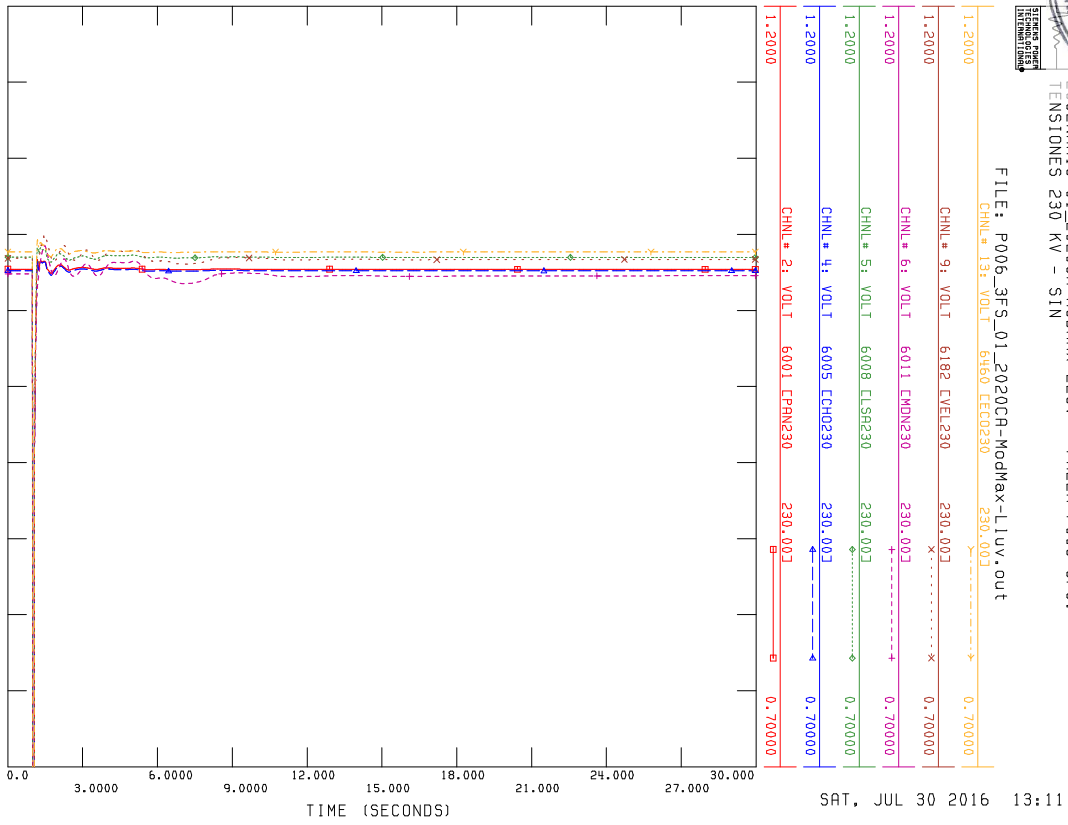


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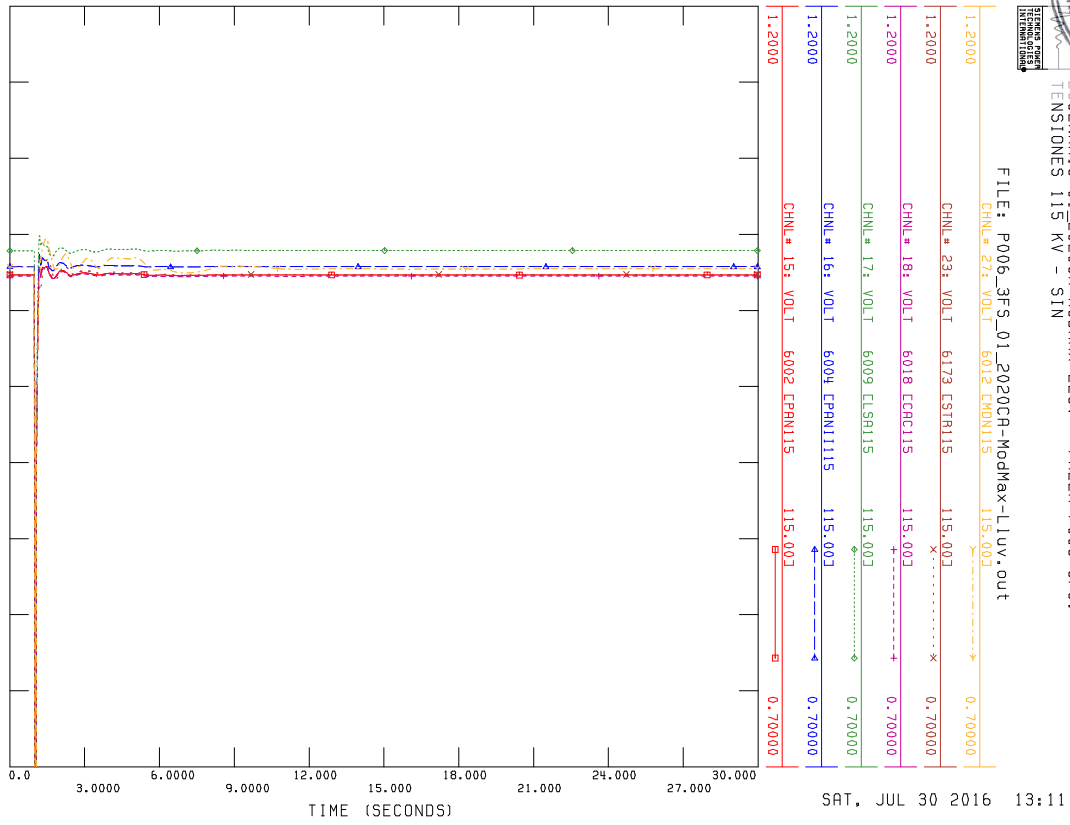
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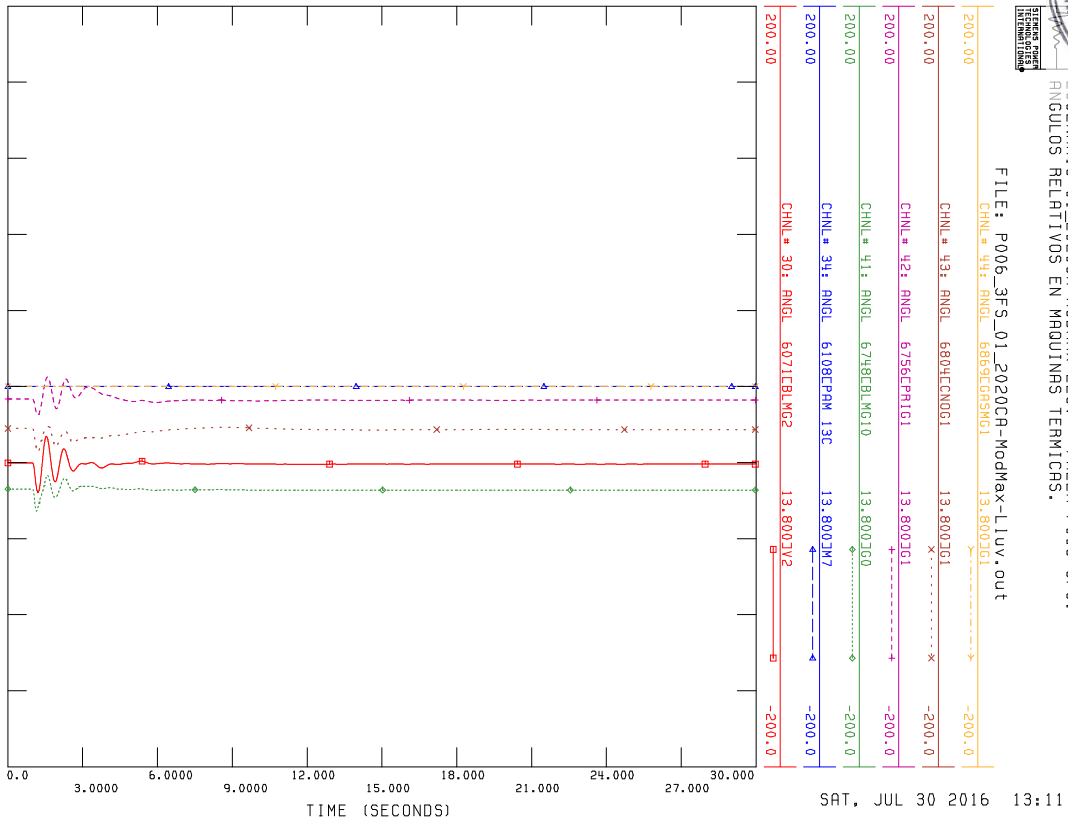








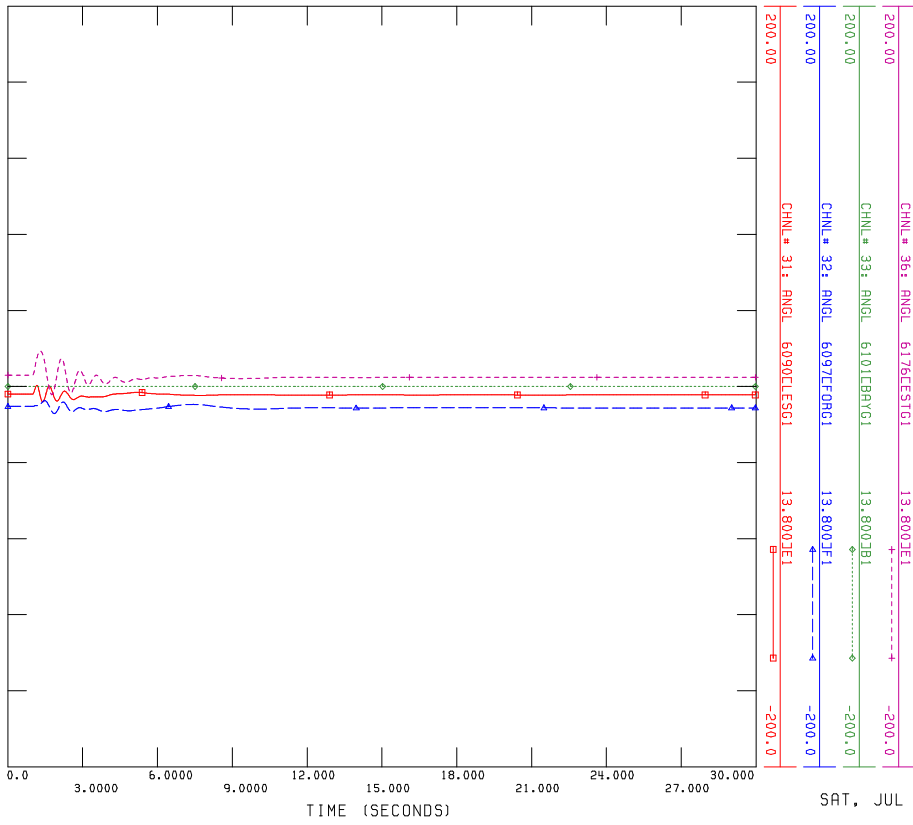
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 ANGULOS RELATIVOS EN MOJUNRS TERCICAS.





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ÁNGULOS RELATIVOS EN MOJINNS HIDRAULICAS.

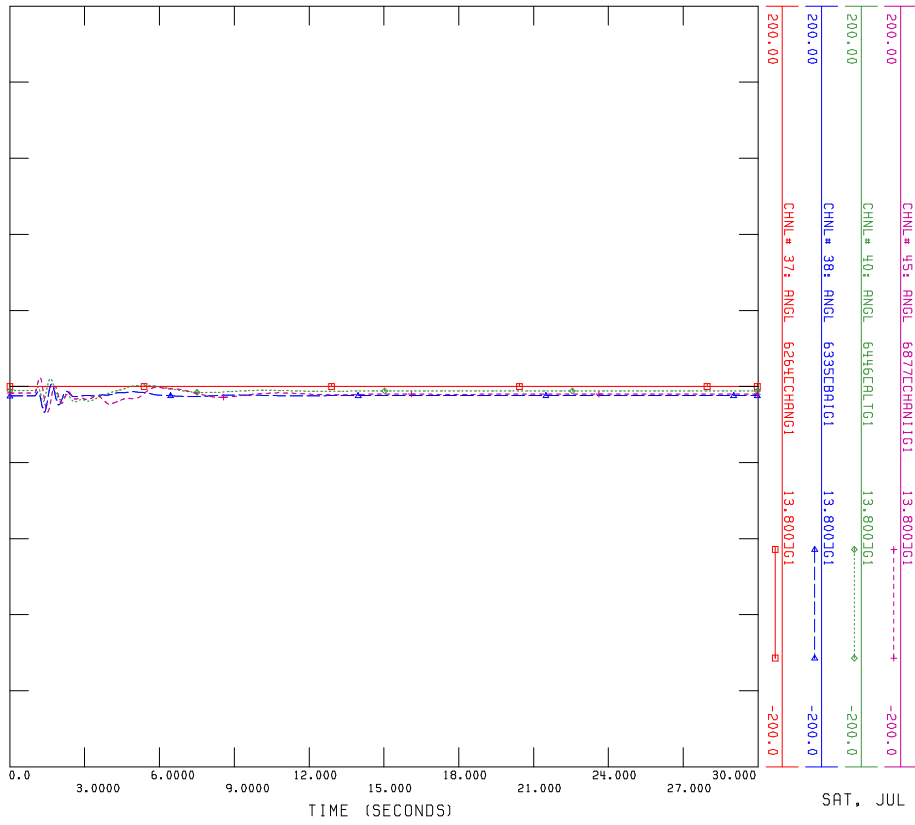
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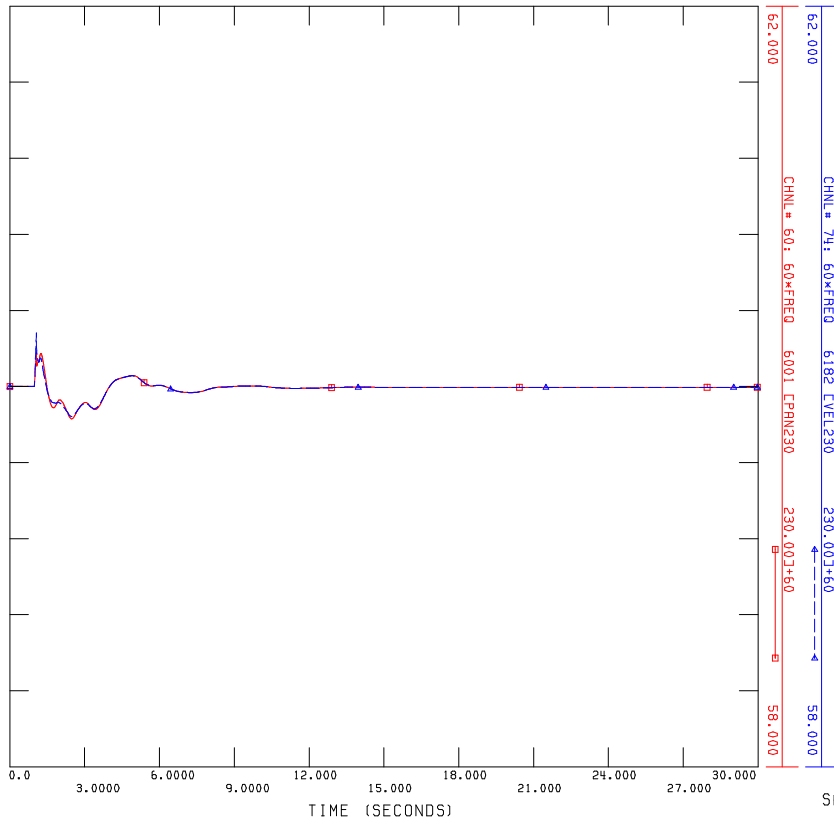
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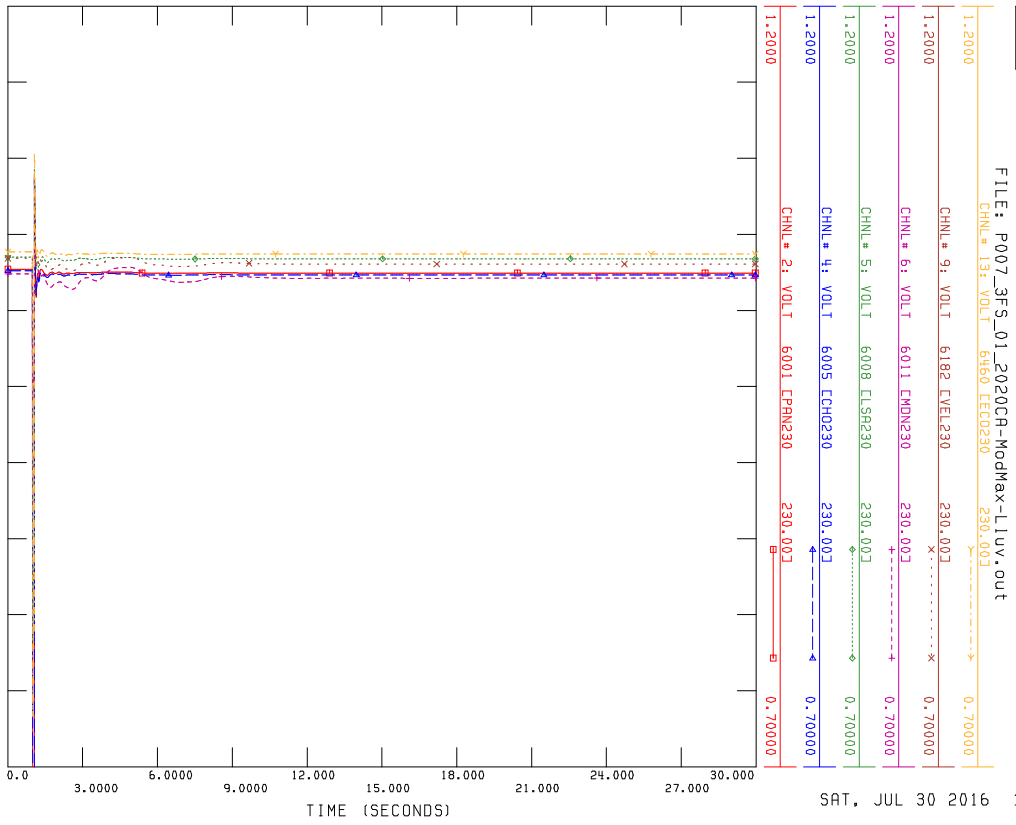
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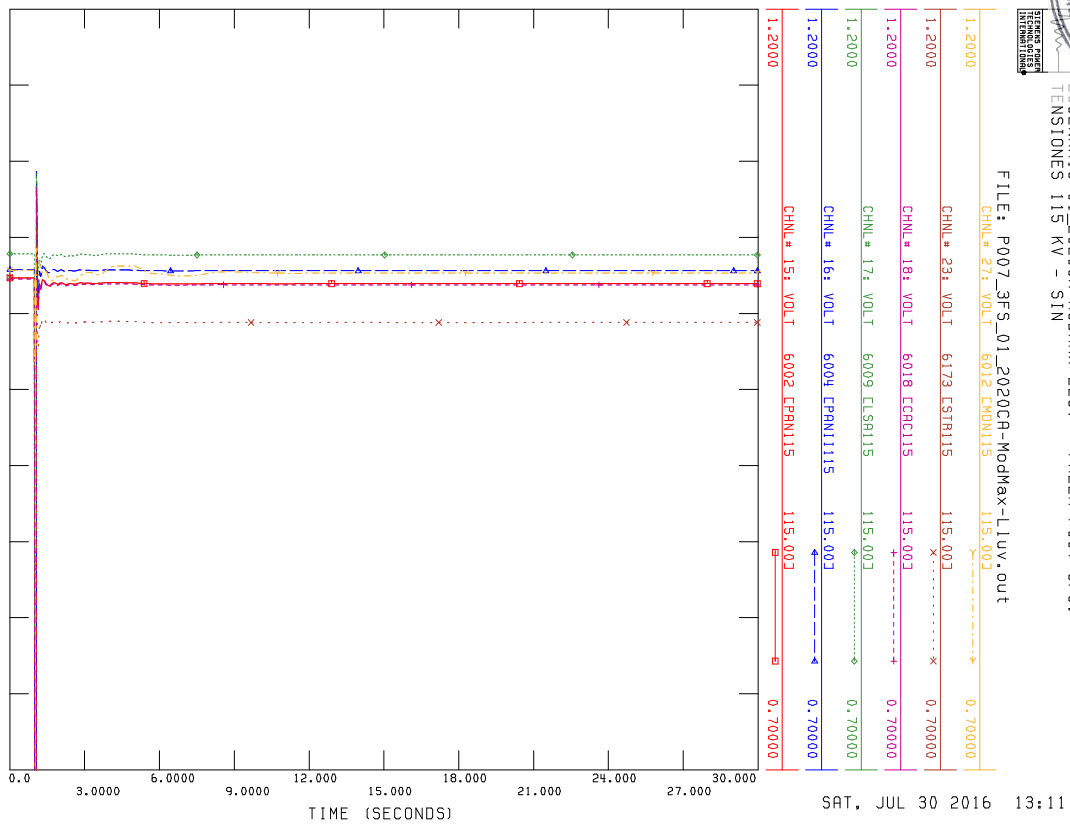
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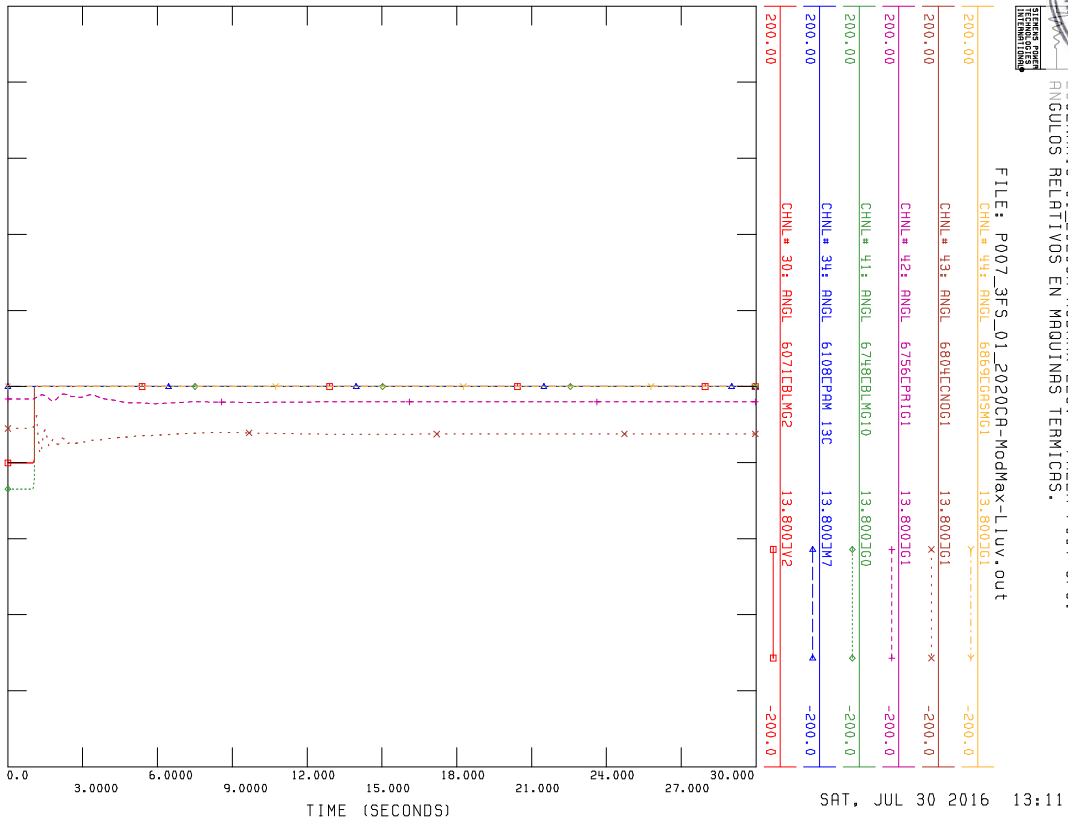
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TENSIONES 230 KV - SIN







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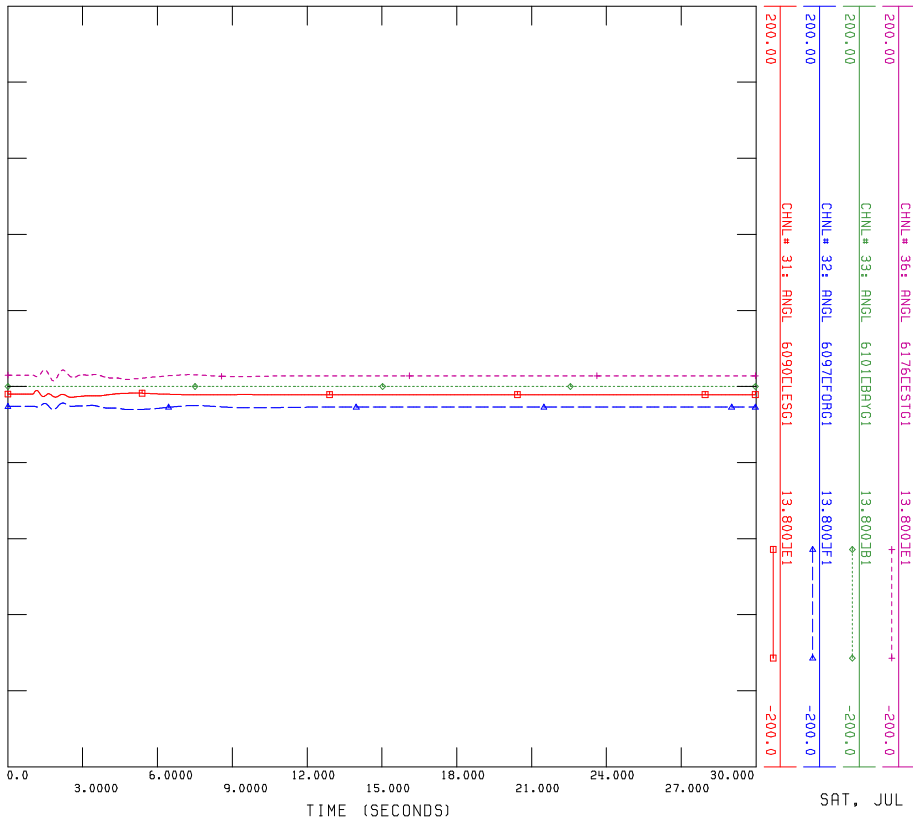






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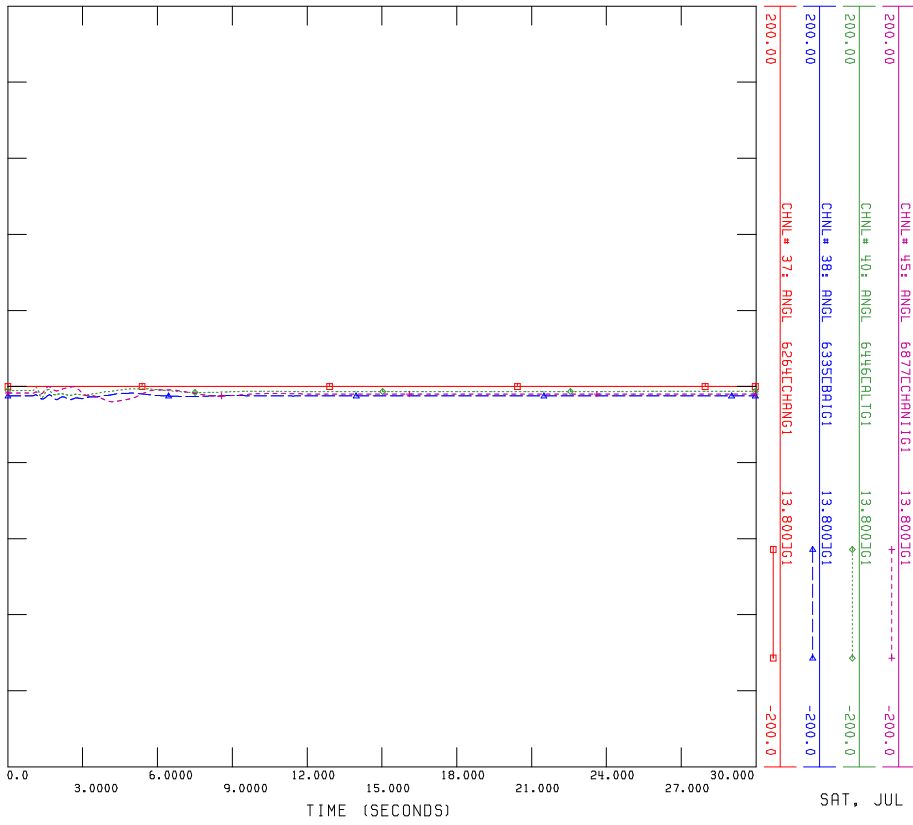


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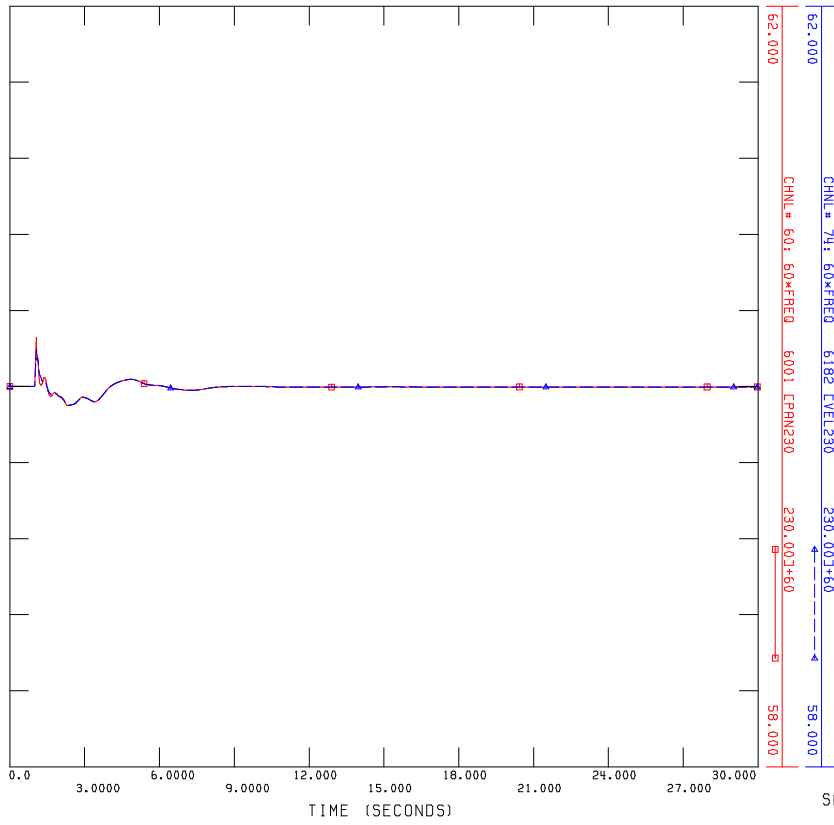
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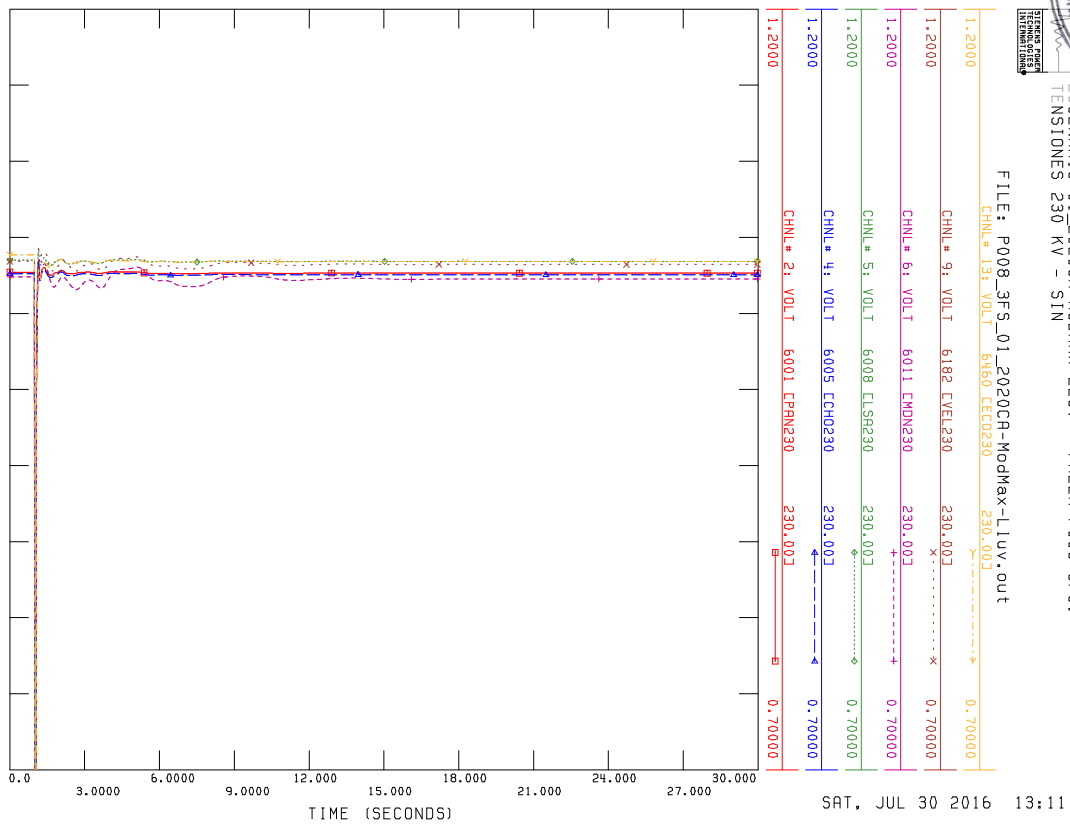
REPUBLICA DE PANAMA  
AUTORIDAD NACIONAL DE LOS SERVICIOS PÚBLICOS

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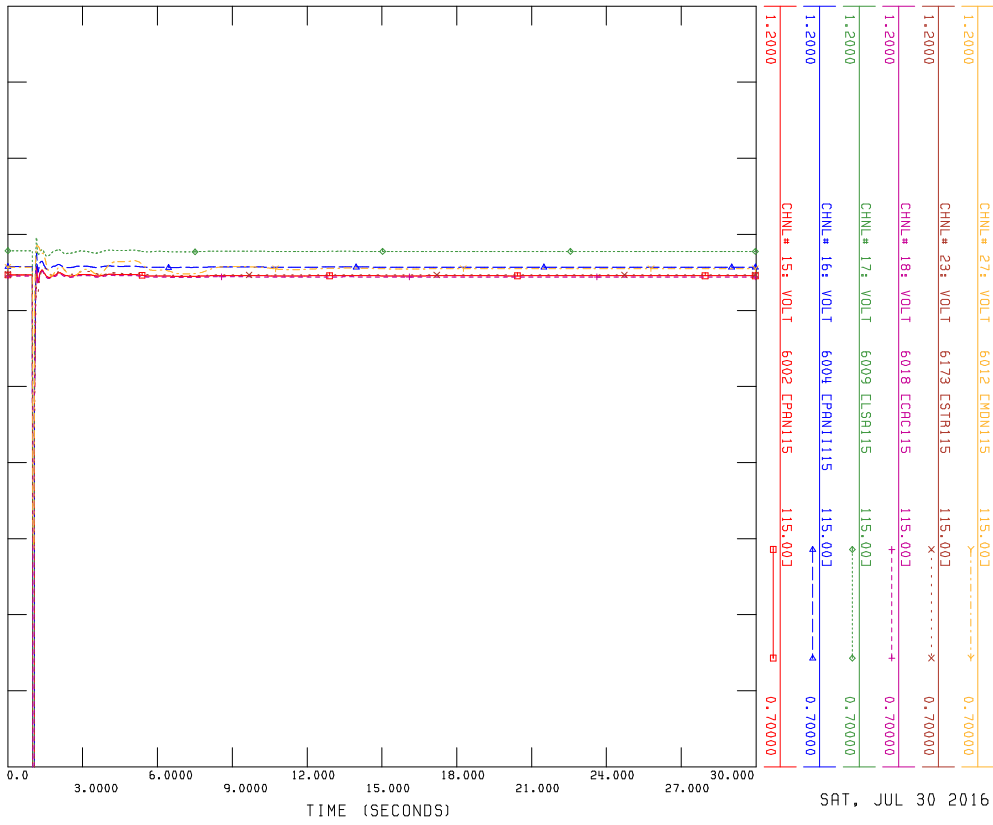




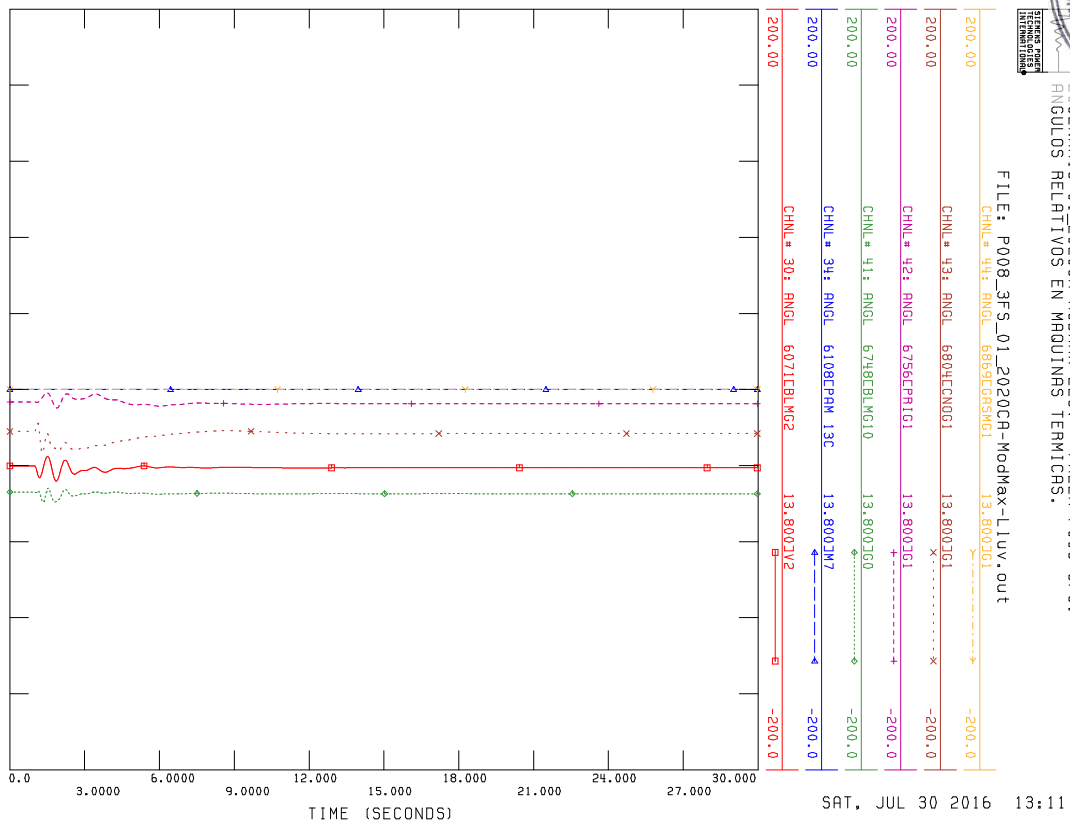
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6002 EPAN115

ESCENARIO 01\_2020CR-MODMAX-LLUV - FALTA P008 3FS.  
TENSIONES 115 KV - SIN

FILE: P008\_3FS\_01\_2020CR-Modmax-LLuv.out



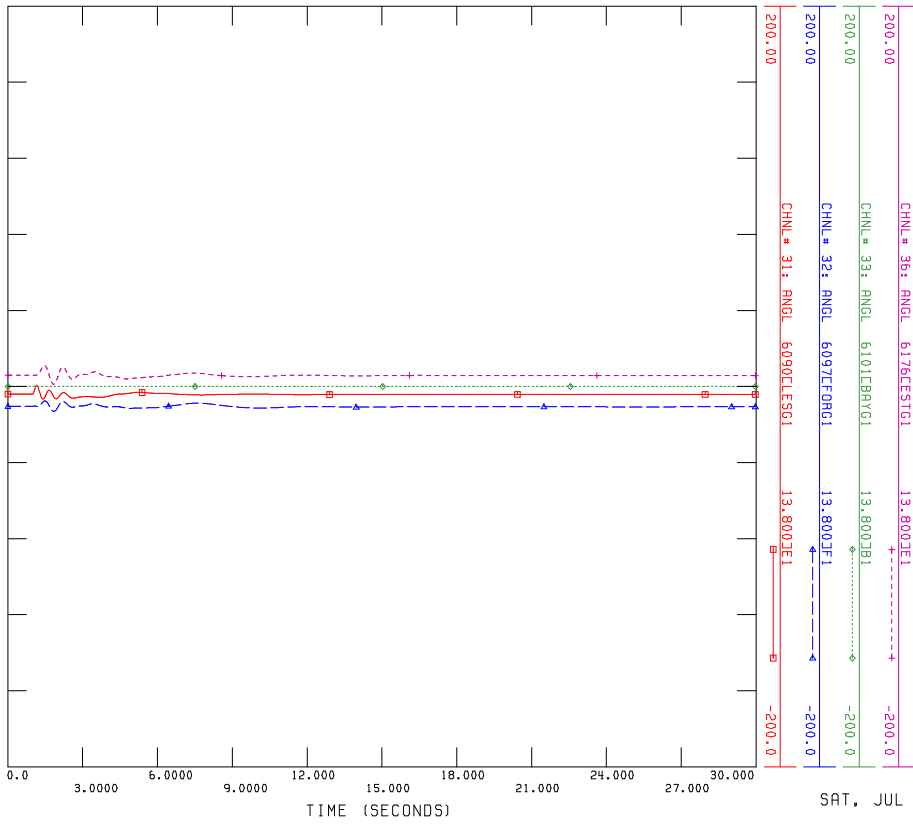
SAT, JUL 30 2016 13:11





ESCENARIO 01\_2020CR-MODMAX-LLUV - FALLA P008 3FS.  
 ANGULOS RELATIVOS EN MAQUINAS HIDRAULICAS.

FILE: P008\_3FS\_01\_2020CR-ModMax-LLuv.out

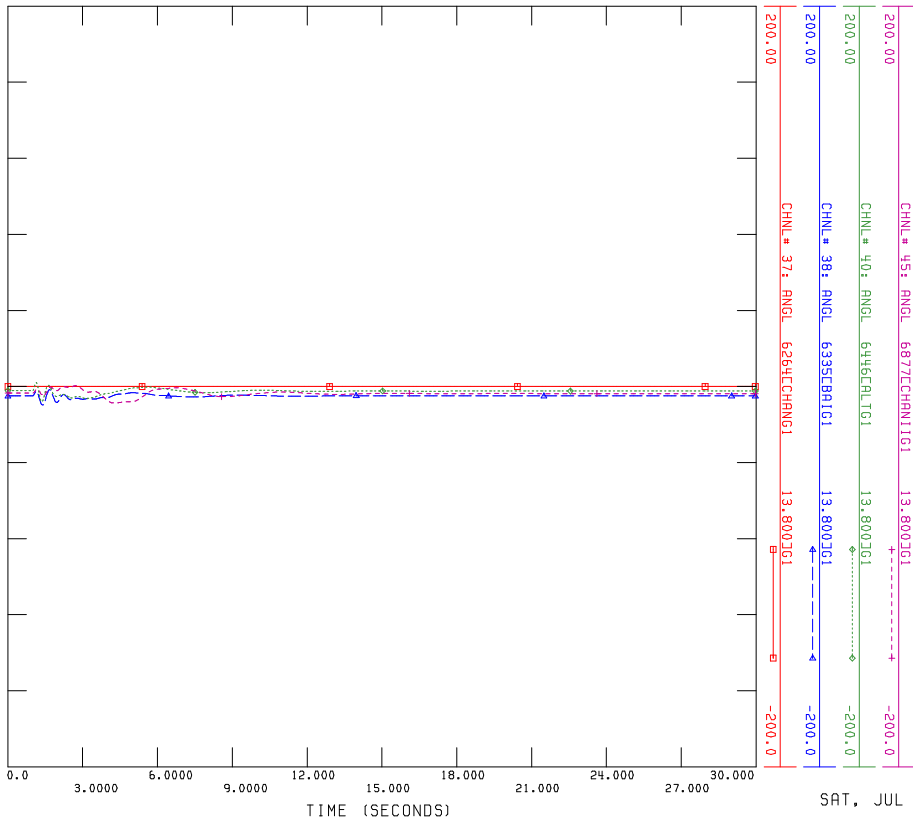


SAT, JUL 30 2016 13:11



ESCENARIO 01\_2020CR-MODMAX-LUV - FALLA P008 3FS.  
 ANGULOS RELATIVOS EN MODULOS HIDRAULICOS.

FILE: P008\_3FS\_01\_2020CR-ModMax-Luv.out



SAT, JUL 30 2016 13:11

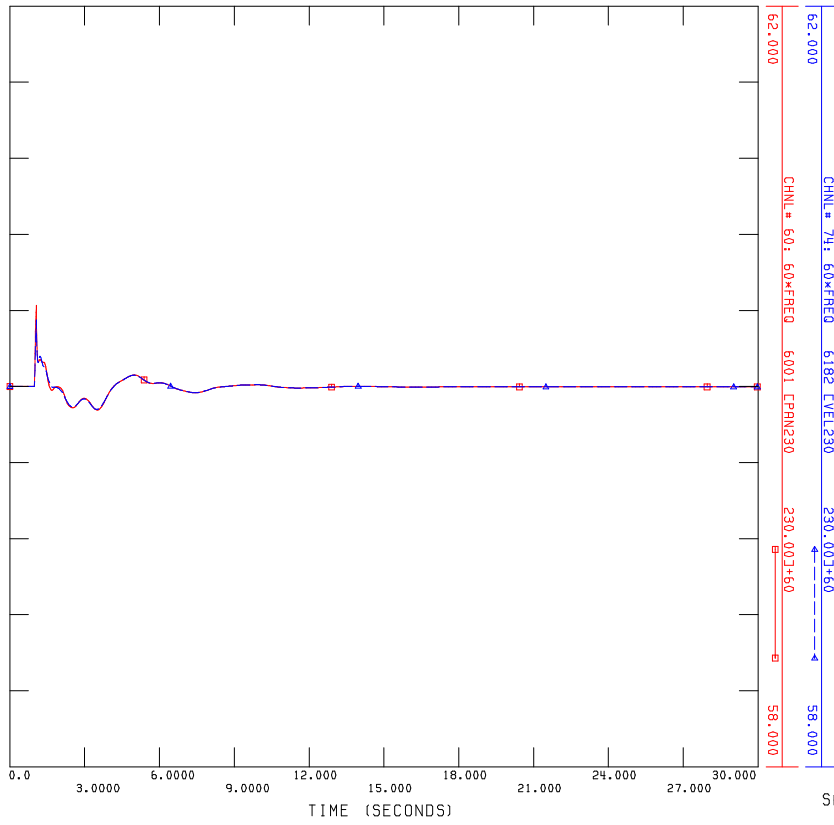




ESCENARIO 01\_2020CR-MODMAX-LLUV - FILLA P008 3FS.

FRECUENCIAS.

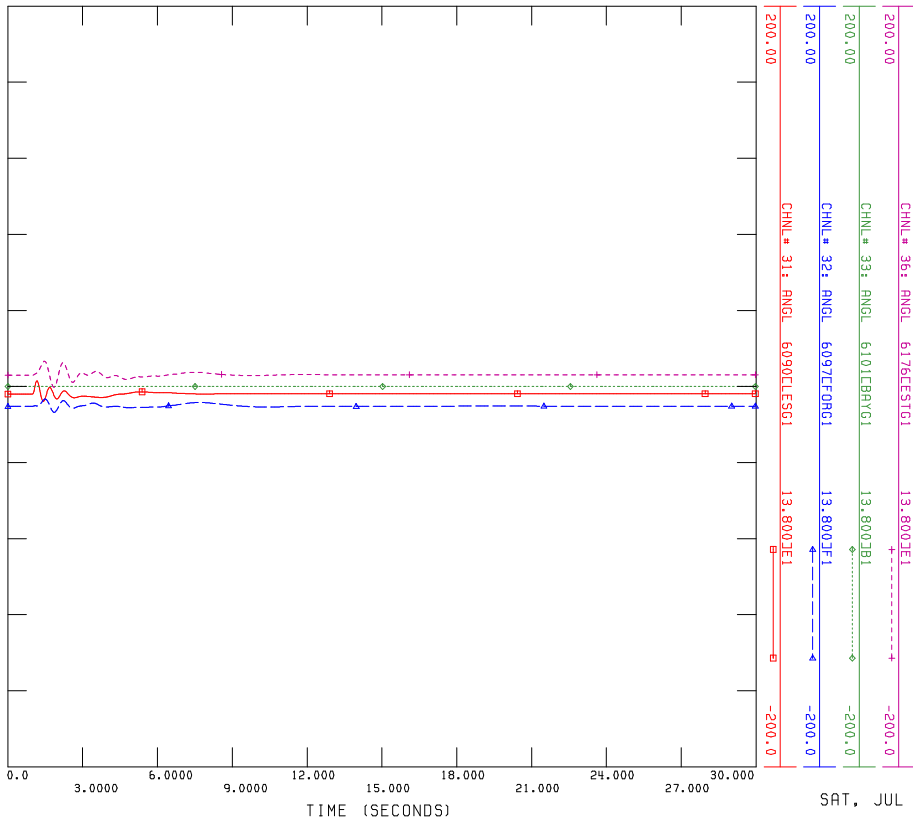
FILE: P008\_3FS\_01\_2020CR-ModMax-Lluv.out





ESCENARIO 01\_2020CR-MODMAX-LLUV - FALLA P015 3FS.  
 ANGULOS RELATIVOS EN MAQUINAS HIDRAULICAS.

FILE: P015\_SFS\_01\_2020CR-ModMax-LLuv.out

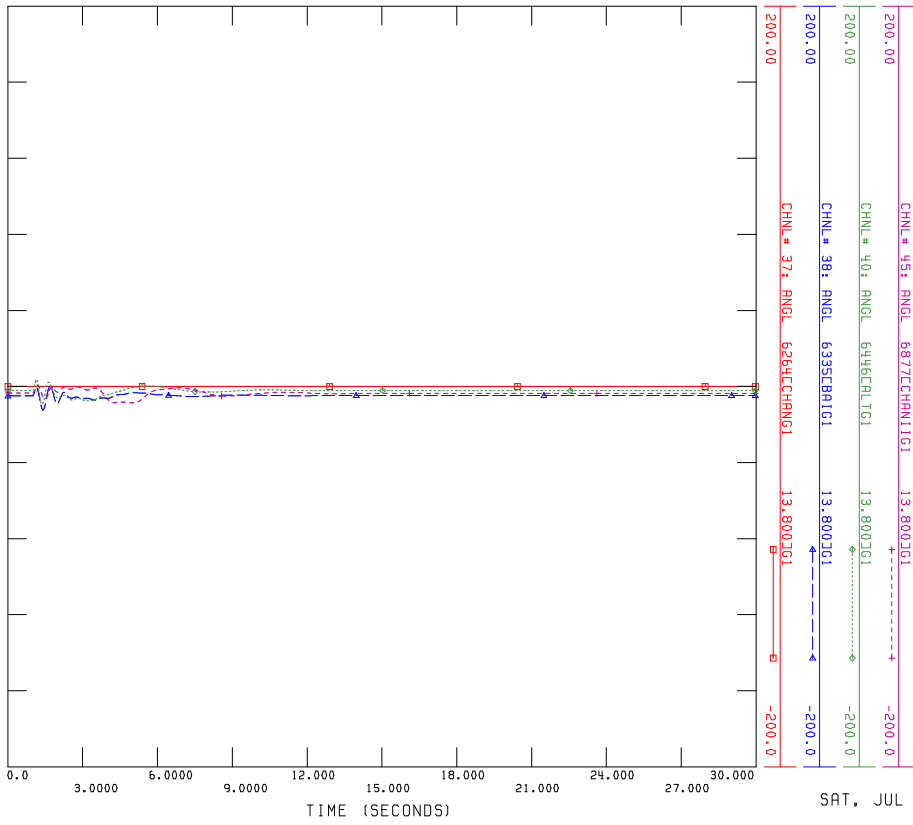


SAT, JUL 30 2016 14:45



ESCENARIO 01\_2020CR-MODMAX-LUV - FALLA P015 3FS.  
 ANGULOS RELATIVOS EN MODULOS HIDRAULICOS.

FILE: P015\_3FS\_01\_2020CR-ModMax-Luv.out



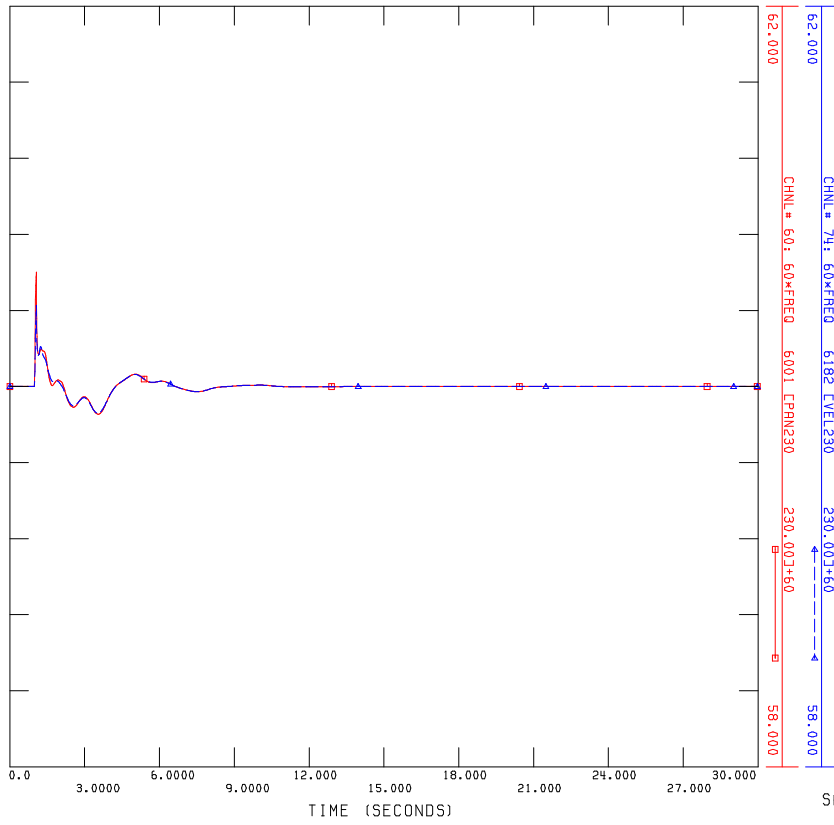
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AUTORIDAD NACIONAL DE LOS SERVICIOS PÚBLICOS

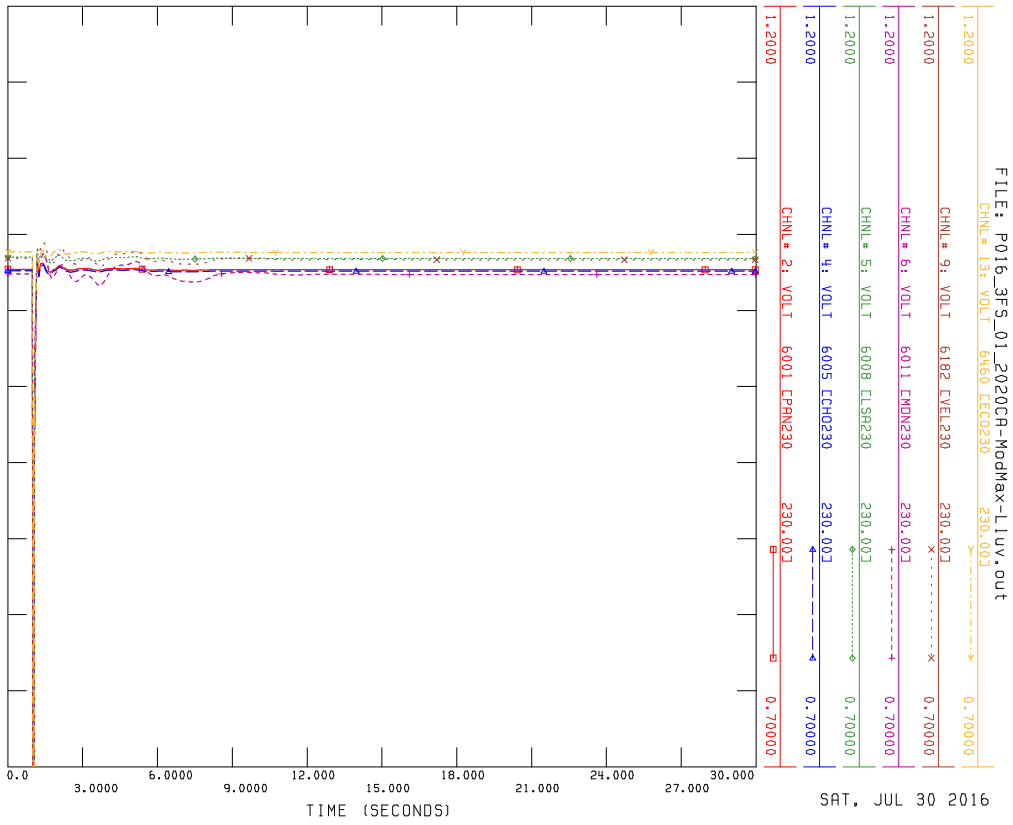
ESCENARIO 01\_2020CR-MODMX-LUV - FALLA P015 3FS.  
FRECUENCIAS.

FILE: P015\_3FS\_01\_2020CR-ModMax-Luv.out



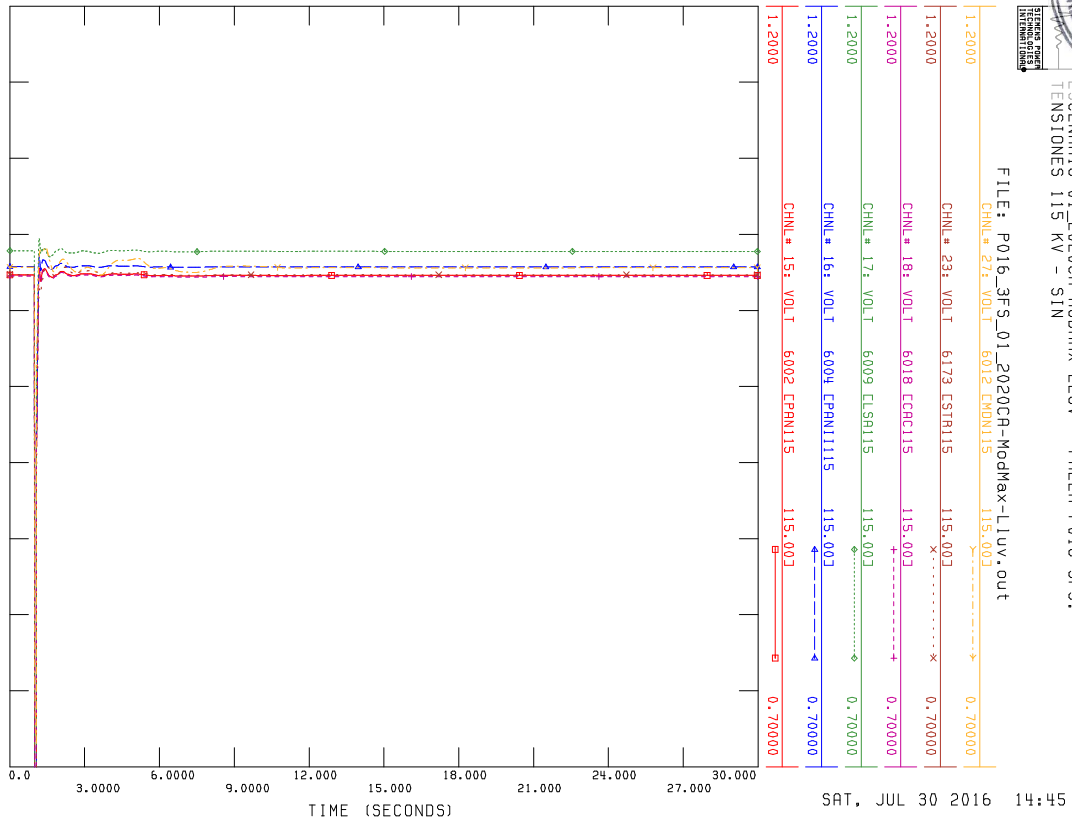


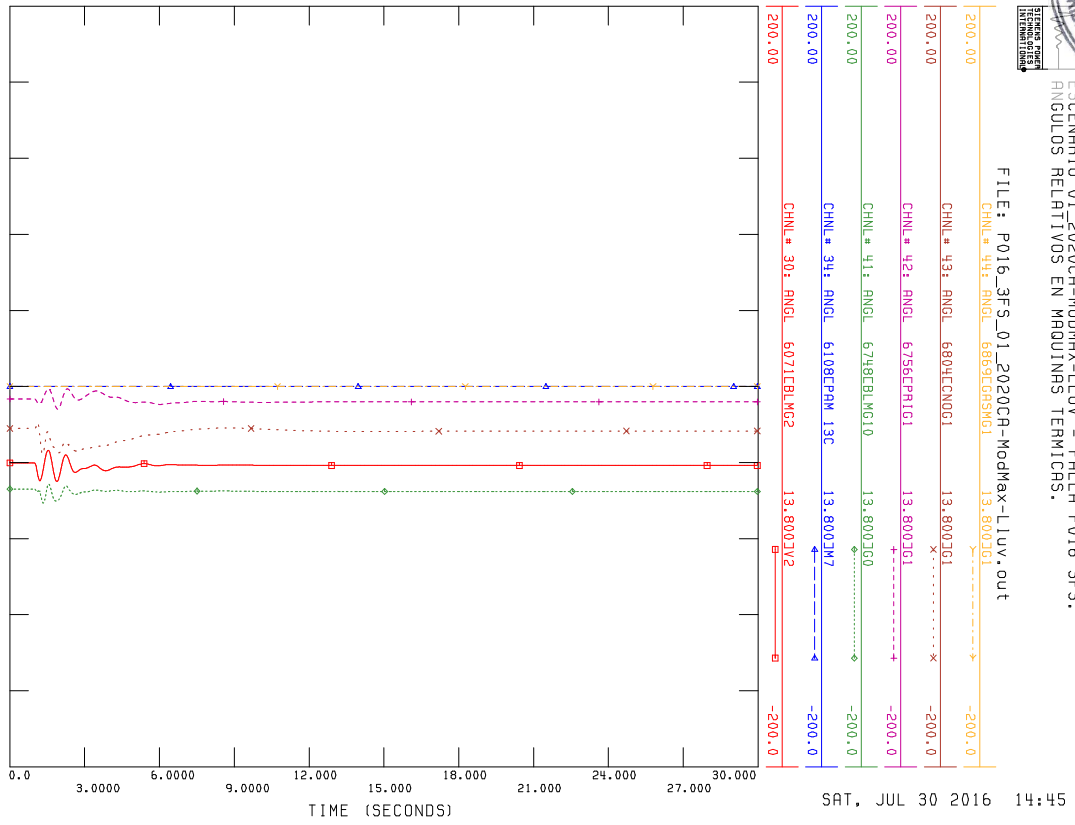
ESCENARIO 01\_2020CR-MODMAX-LLUV - FALTA P016 3FS.  
TENSIONES 230 KV - SIN





ESCENARIO 01\_2020CR-MODMAX-LLUV - FALLA P016 3FS.  
TENSIONES 115 KV - SIN

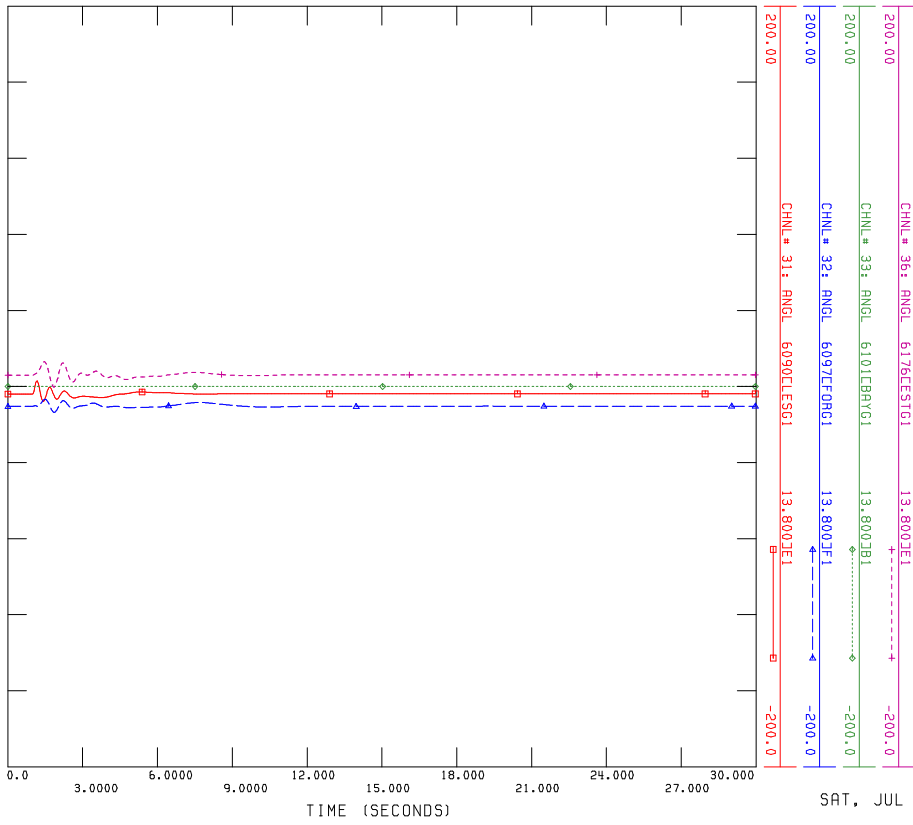






ESCENARIO 01\_2020CR-MODMAX-LLUV - FALLA P016 3FS.  
 ANGULOS RELATIVOS EN MODULOS HIDRAULICOS.

FILE: P016\_SFS\_01\_2020CR-ModMax-LLuv.out



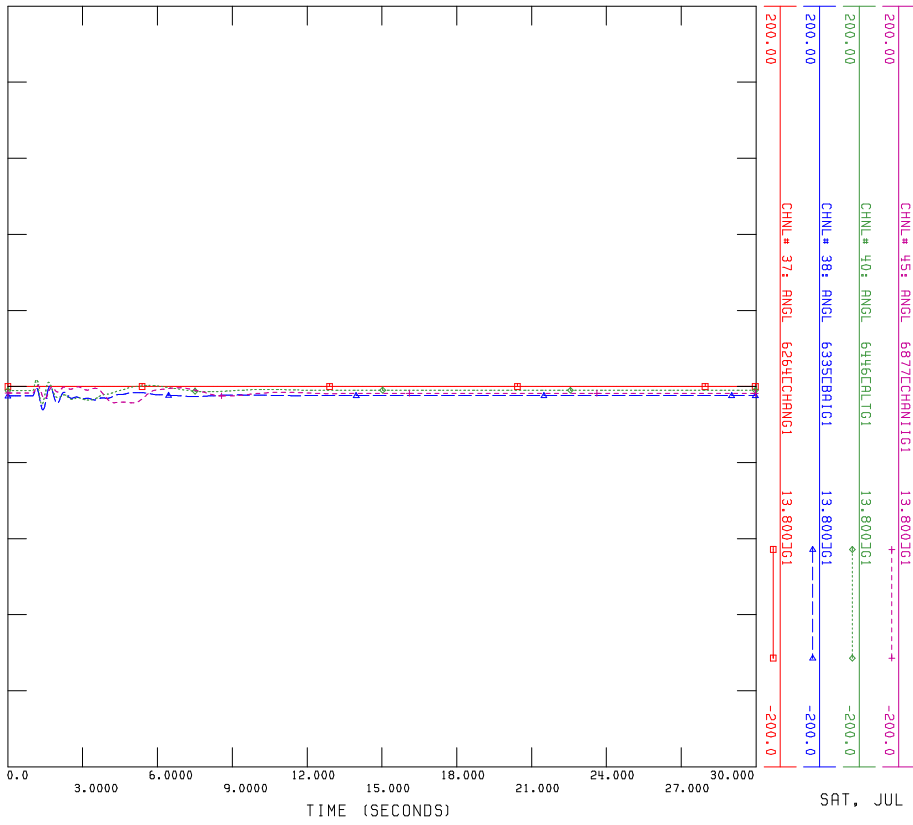
SAT, JUL 30 2016 14:45





ESCENARIO 01\_2020CR-MODMAX-LUV - FALLA P016 3FS.  
ÁNGULOS RELATIVOS EN MODULOS HIDRAULICOS.

FILE: P016\_3FS\_01\_2020CR-ModMax-Luv.out



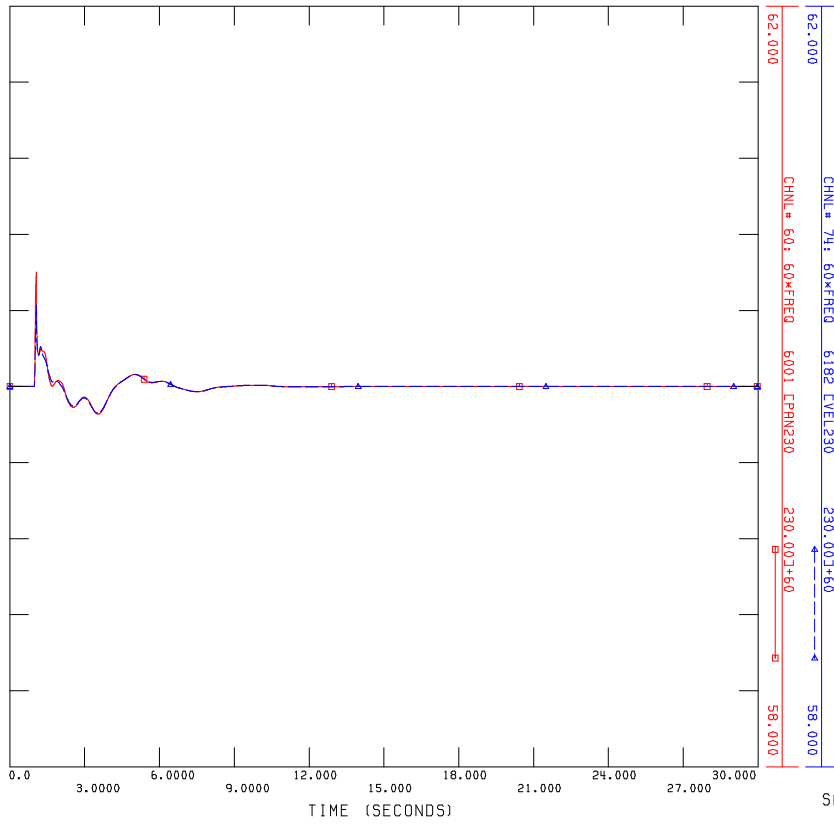
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ESCENARIO 01\_2020CR-MODMAX-LLUV - FILLA P016 3FS.

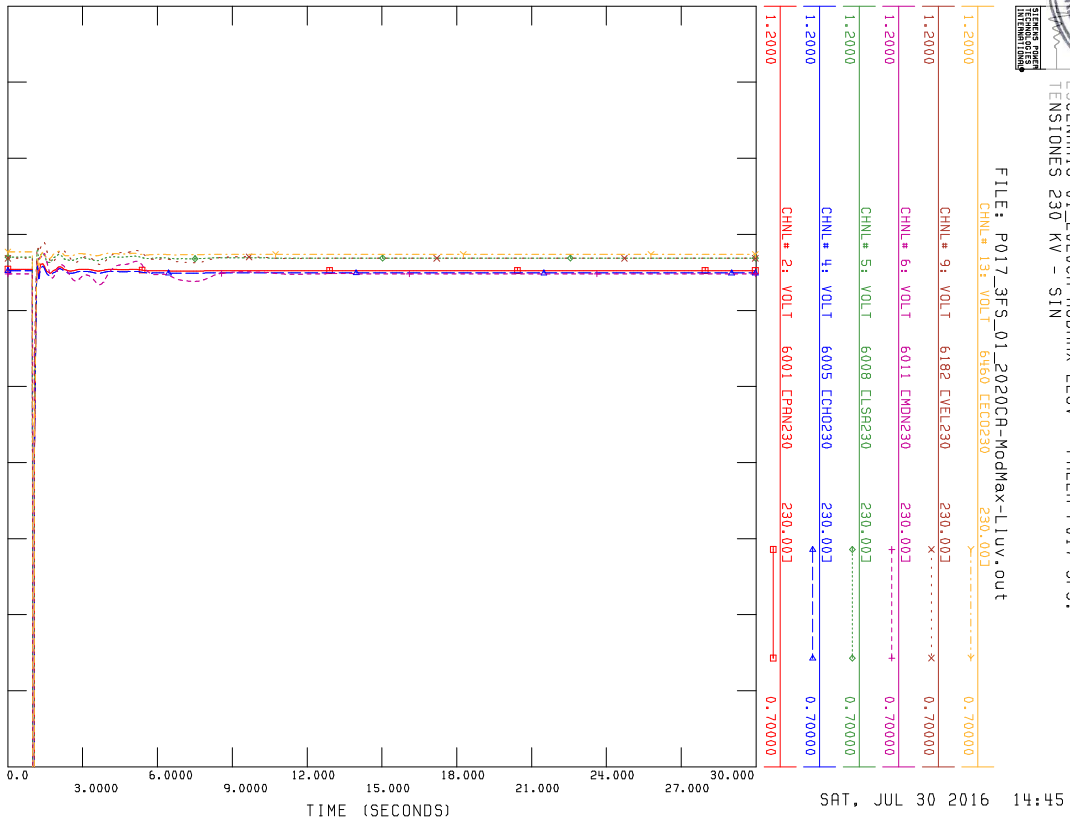
FRECUENCIAS.

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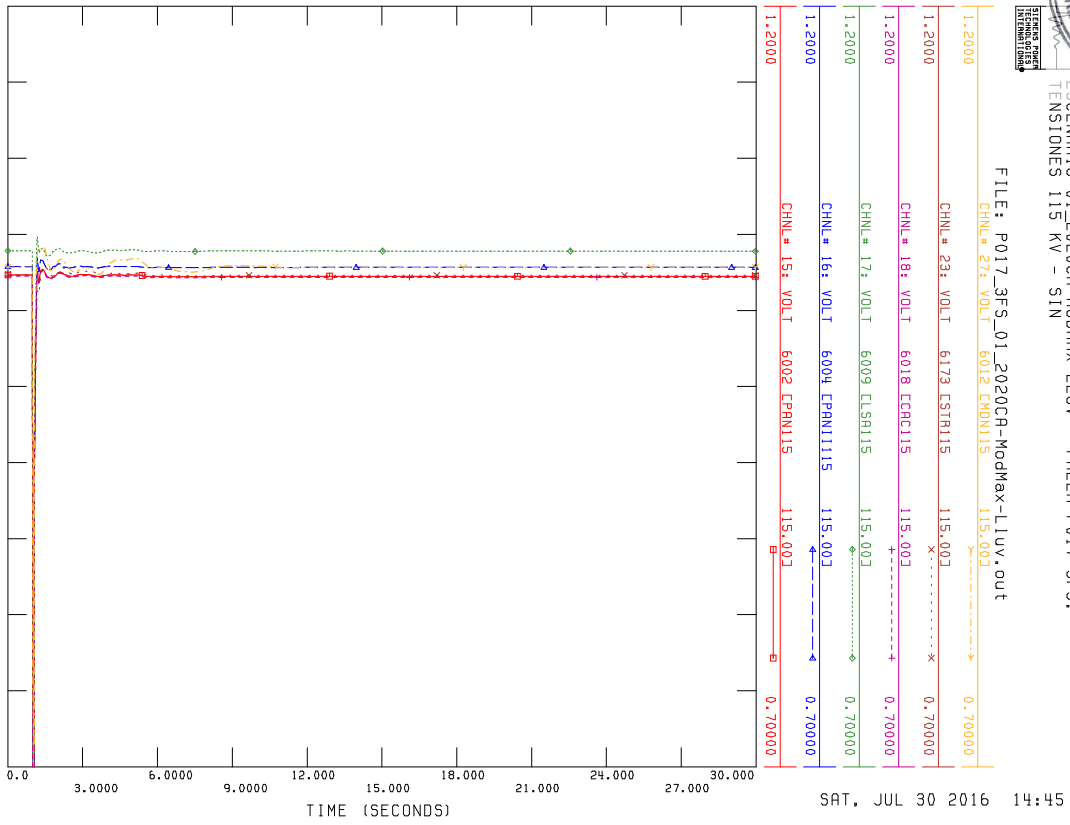


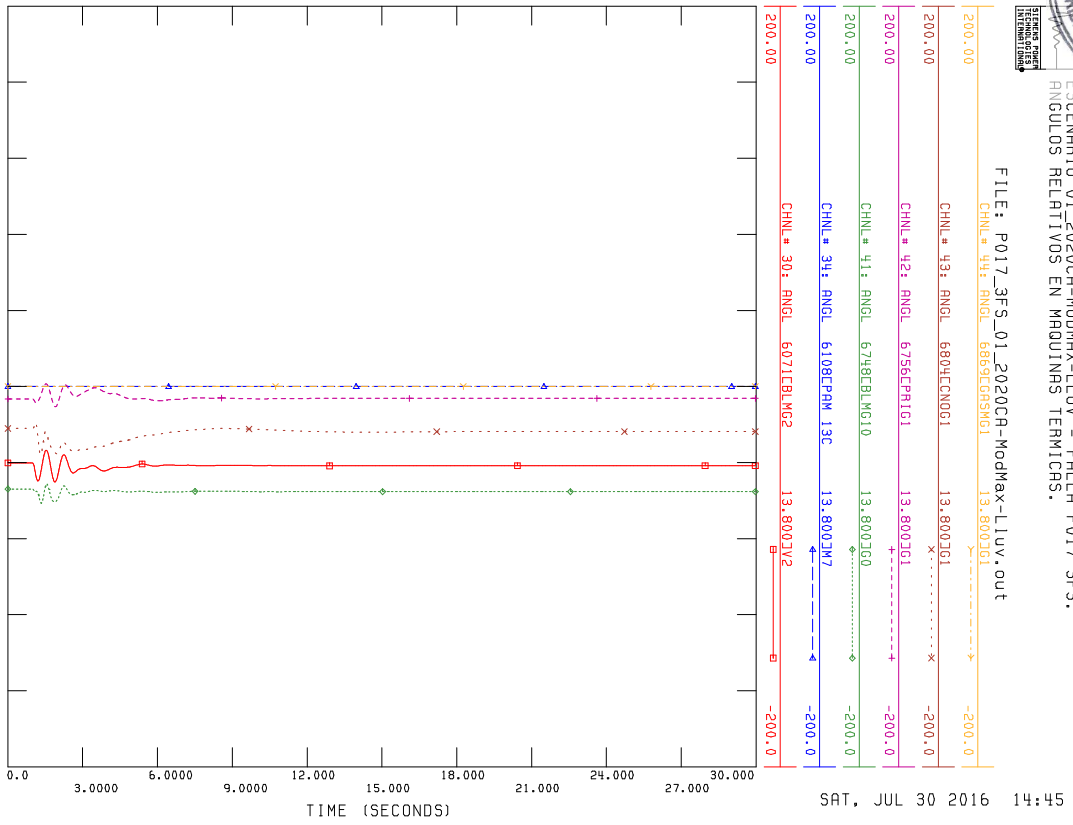
ESCENARIO 01\_2020CR-MODMAX-LLUV - FALLA P017 3FS.  
TENSIONES 230 KV - SIN





ESCENARIO 01\_2020CR-MODMAX-LLUV - FALLA P017 3FS.  
TENSIONES 115 KV - SIN

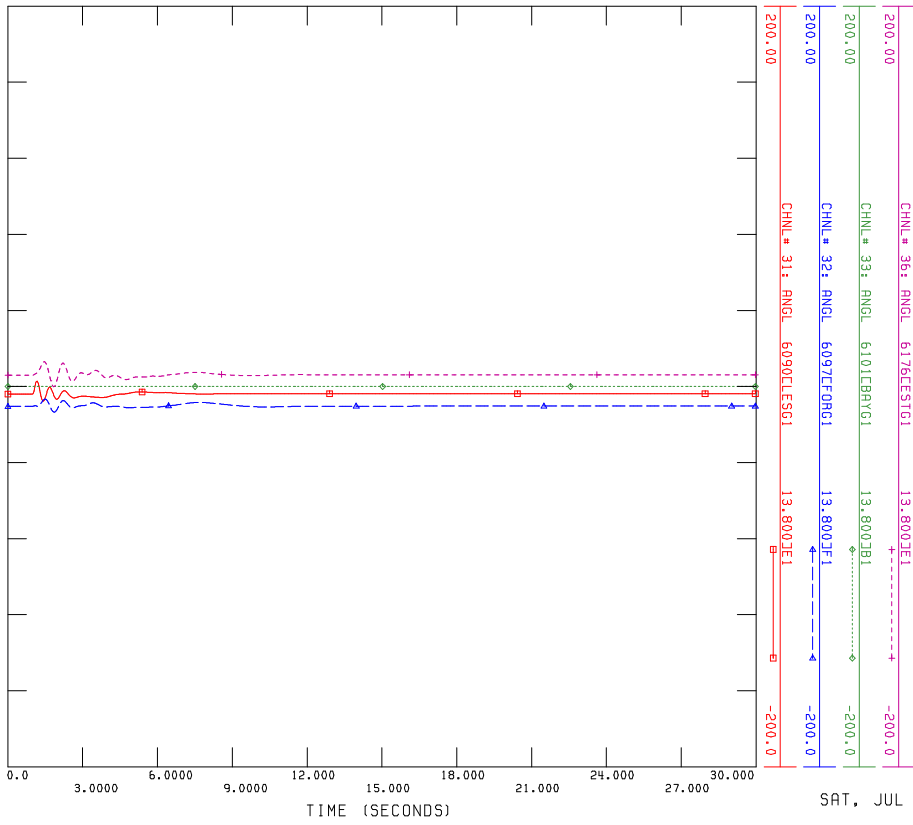






ESCENARIO 01\_2020CR-MODMAX-LLUV - FALLA P017 3FS.  
 ANGULOS RELATIVOS EN MAQUINAS HIDRAULICAS.

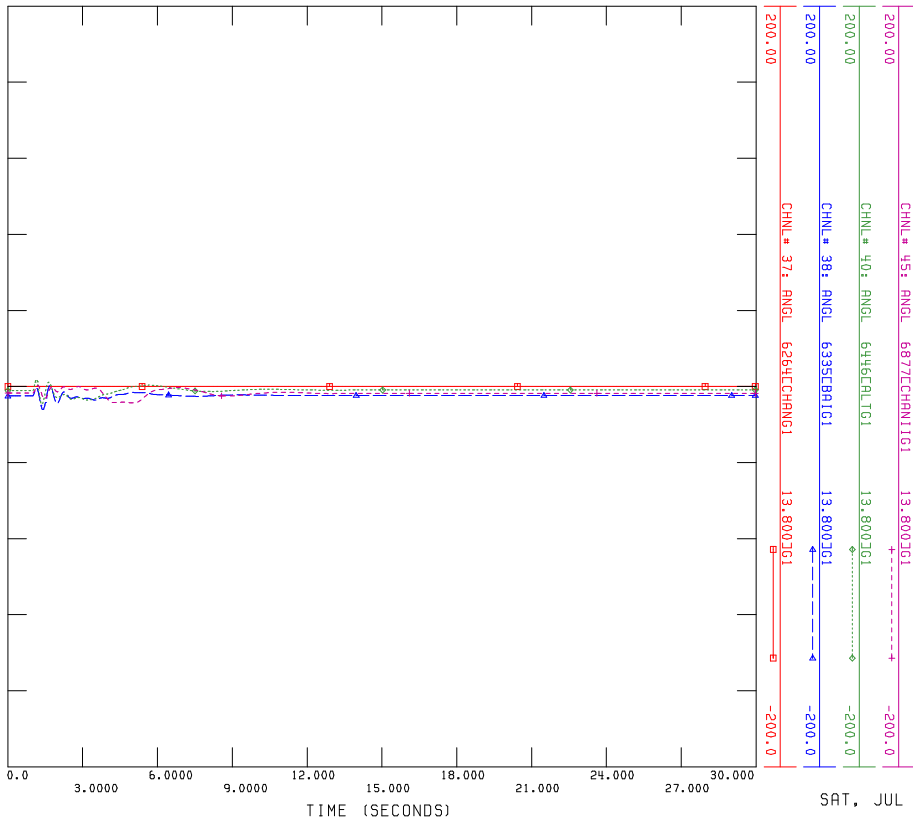
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ESCENARIO 01\_2020CR-MODMAX-LUV - FALLA P017 3FS.  
ÁNGULOS RELATIVOS EN MODULOS HIDRAULICOS.

FILE: P017\_3FS\_01\_2020CR-ModMax-Luv.out



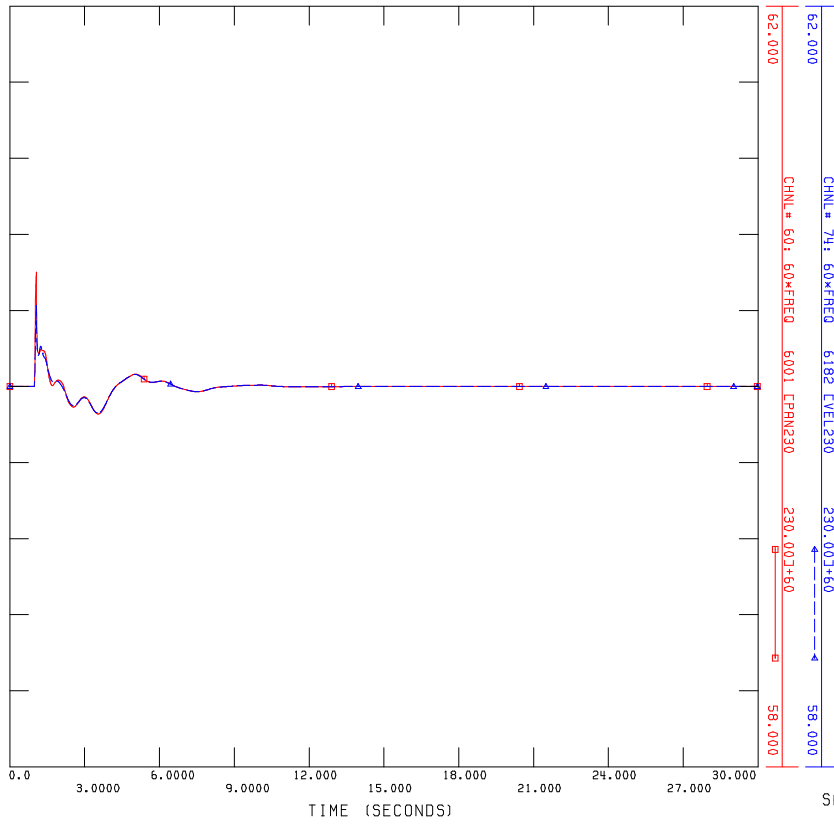
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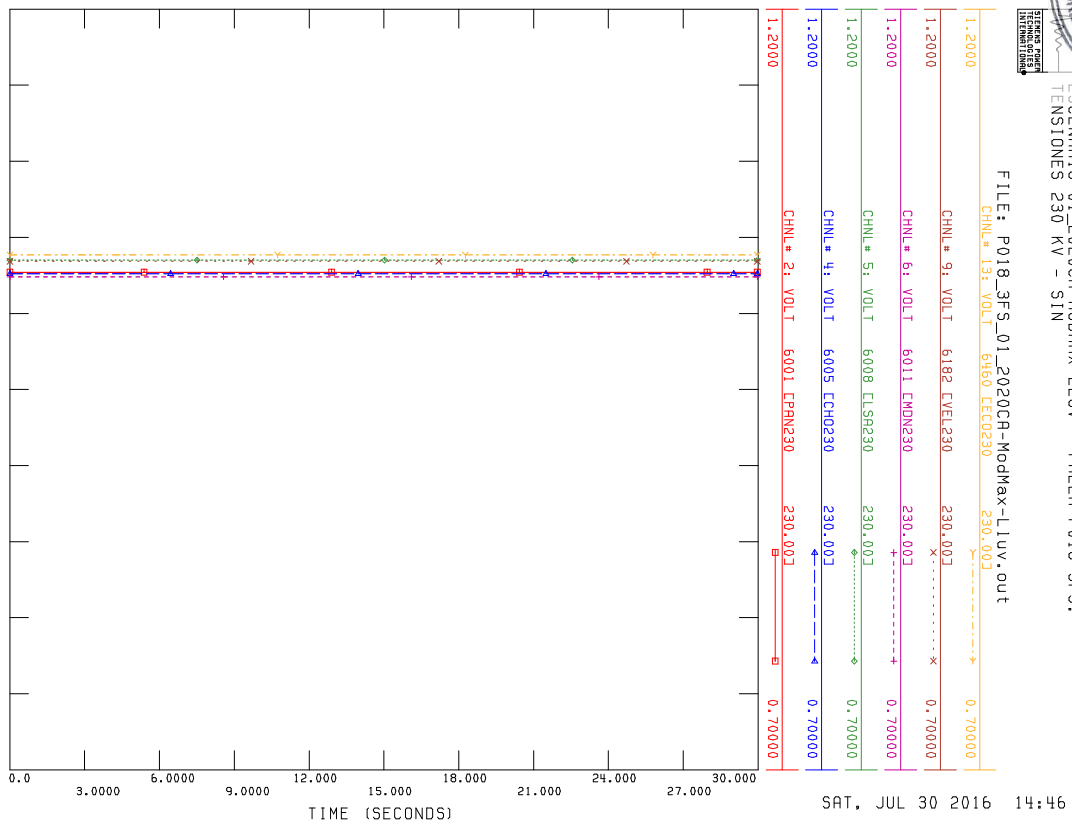
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AUTORIDAD NACIONAL DE LOS SERVICIOS PÚBLICOS

ESCENARIO 01\_2020CR-MODMX-LUV - FALLA P017 3FS.  
FRECUENCIAS.

FILE: P017\_SFS\_01\_2020CR-ModMax-Luv.out









ESCENARIO 01\_2020CR-MODMAX-LLUV - FALLA P018 3FS.  
TENSIONES 115 KV - SIN

