PRE – TA PROCESS SAFETY REFRESH TRAINING

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3rd December 2024
4th European Conference on Plant and Process Safety,
Barcelona

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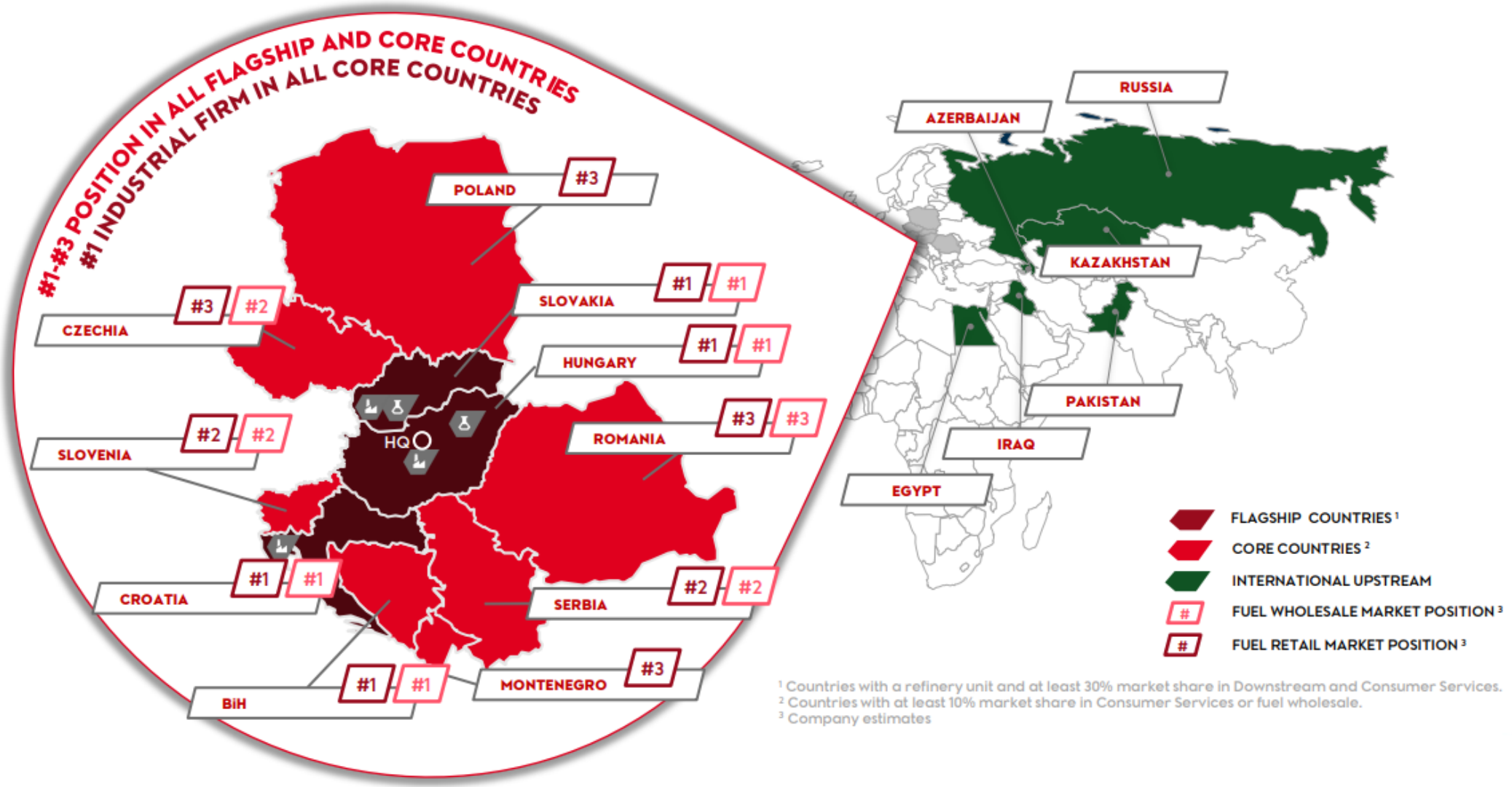
MOL IS THE DOMINANT O&G PLAYER OF THE CEE REGION



[1] Countries with a refinery unit and at least 30% market share in Downstream and Consumer Services.
[2] Countries with at least 10% market share in Consumer Services or fuel wholesale.
[3] Company estimates

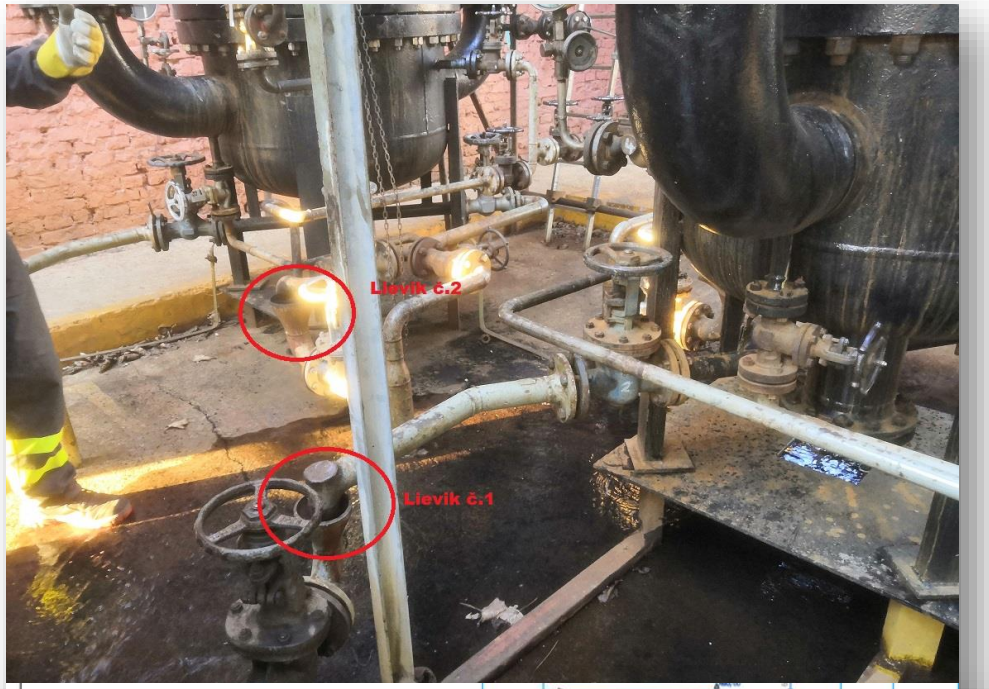
A CALL FOR SAFETY AWARENESS IMPROVEMENT

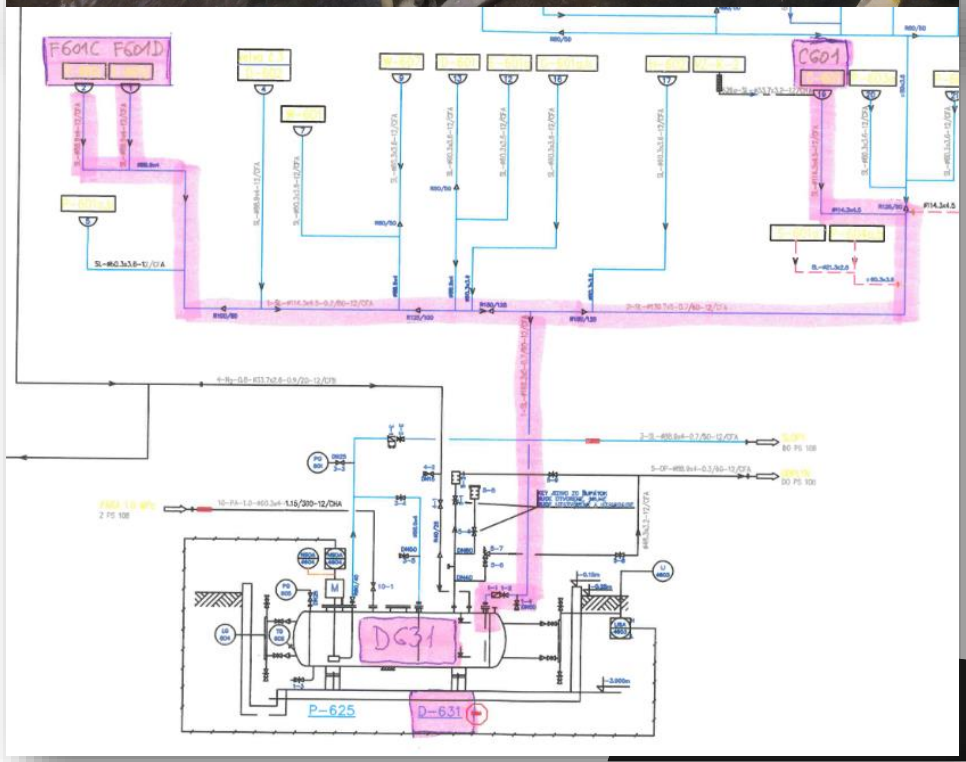
TIER 1 process event at Heavy Naphtha Hydrotreater with multiple occupational accident caused by gas and aerosol leakage

NHT was in the process of planned shutdown for scheduled turnaround. As a part of shutdown activities, operators were draining heavy naphtha to open slop system on several positions.
A gas detection system alarm was triggered in the DCS system. At the same time, it was also registered by the outside operators. The alarm was caused by a heavy naphtha release with hydrogen sulfide content from an open valve on the feed filters F601C,D. Outside operators in an attempt to stop the hydrocarbon release became unconscious. After receiving pre-medical assistance, the four employees were transported to multiple medical facilities.

- Consequence: Lost time injury, 4 employees
- Potential consequence: multiple fatalities

Incident investigation discovered **LIFE SAVING RULES** (PPE - personal gas detector, protective masks), and **PROCESS SAFETY FUNDAMENTALS** (Monitor an open drain) violations.





TRAINING AIM = zero LTI during TA

Before the planned TechSD/TA of production units, main attention was paid to the preparation/safety training of contractors.

Training for our own staff was not available.

PRE-TA PROCESS SAFETY REFRESH TRAINING WAS DEVELOPED TO INCREASE THE PREPAREDNESS OF UNIT STAFF AND ENHANCE SAFETY OF T/A ACTIVITIES

Collect existing knowledge and best practices from process units where TechSD/TA was planned

Prepare the training material together with unit staff. In second phase, also HSE and TA office colleagues were involved

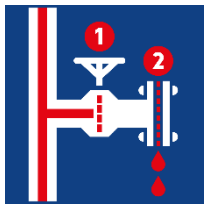
EXECUTE TRAINING, collect feedback and improve

C1 - PUBLIC

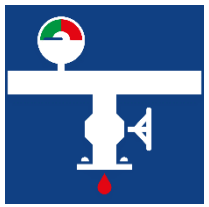
TRAINING SCOPE

- Principles of safe operation: LSR, PSF
- Lessons Learnt from incidents from previous TA
- S/D, Decontamination, S/U
- PtW, LOTO, Blinding
- MC & PPSR
- Operational discipline & Chronic Unease

PROCESS SAFETY FUNDAMENTALS



1. ENSURE PROPER EQUIPMENT ISOLATION FOR NORMAL OPERATION AND MAINTENANCE WORKS



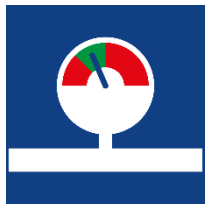
2. DE-ENERGIZE EQUIPMENT BEFORE OPENING AND REENERGIZE IT BEFORE START-UP

3. MONITOR AN OPEN DRAIN

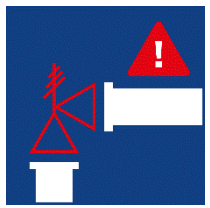
4. MANAGE OVERRIDES OF SAFETY CRITICAL SYSTEMS

5. WALK THE LINE (TO ENSURE OPERATIONAL READINESS VIA PIPELINE AND VALVE LINE-UPS)

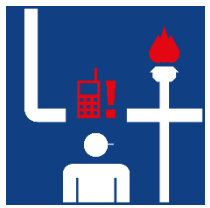
6. VERIFY THE CONDITION OF FLEXIBLE HOSES



7. OPERATE WITHIN SAFE LIMITS



8. IDENTIFY SAFETY CRITICAL EQUIPMENT AND REPORT ON THEIR DEFICIENCIES



9. ENSURE SAFE ATMOSPHERE IN FIRE BOX BEFORE IGNITING THE BURNERS

10. DO NOT MAKE A CHANGE WITHOUT A PROPER MOC PROCESS

LIFE SAVING RULES

USE ALL REQUIRED PPE AND EQUIPMENT FIT FOR PURPOSE

MONITOR THE ATMOSPHERE AND FOLLOW THE PERMIT TO WORK

APPLY HAZARD AND ENERGY ISOLATION,
ENSURE SAFETY CONTROLS ARE IN PLACE

OBTAIN AUTHORIZATION BEFORE ENTERING A CONFINED SPACE

FOLLOW SAFE LIFTING RULES

DRIVE SAFELY

PREVIOUS INCIDENTS DURING S/D, TA and S/U after planned Maintenance

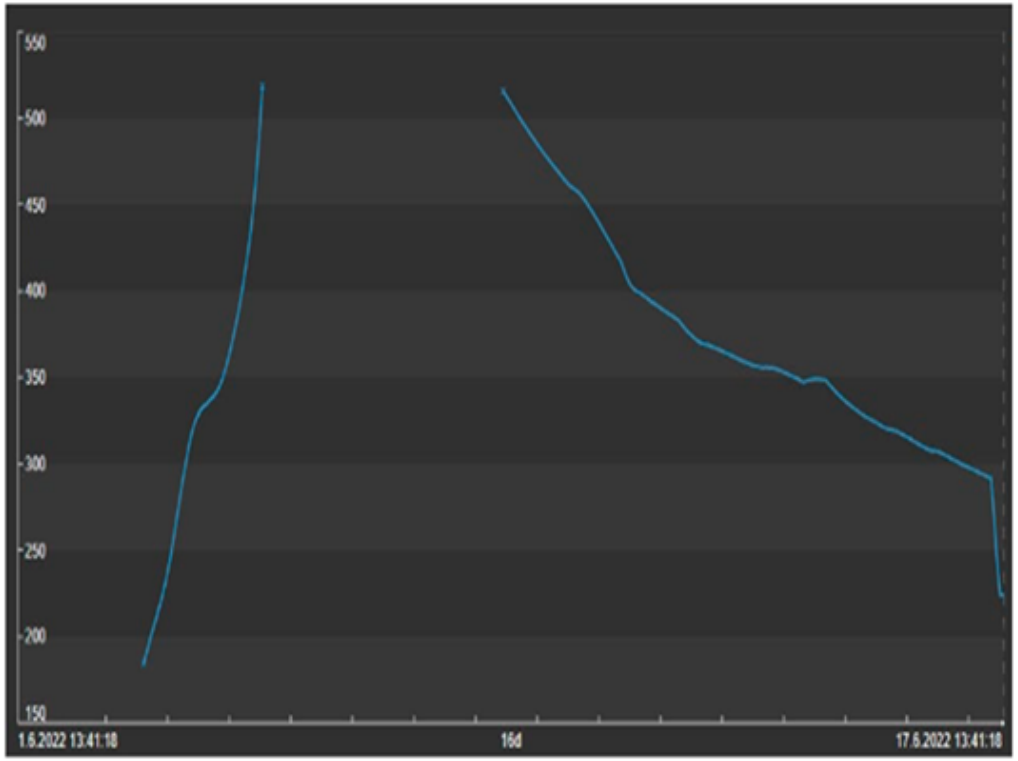
Fire on pipeline DN 8´´ to column 11C301 at Residual Hydrocracker unit, 23.9.2021:

- During annealing of the welds on pipeline, smoke penetrated to column 11C301 where the second group of workers was working inside
- Cause: insufficient isolation of two workplaces – pipeline/column, unrecognized risk resulting from parallel work execution, deficiencies at granting of PTW
- Consequence: endangering the health of workers performing work inside the column

PREVIOUS INCIDENTS DURING S/D, TA and S/U after planned Maintenance

Oxidation reaction in reactor R102.201 at Hydrogen Production Plant, 17.6.2022

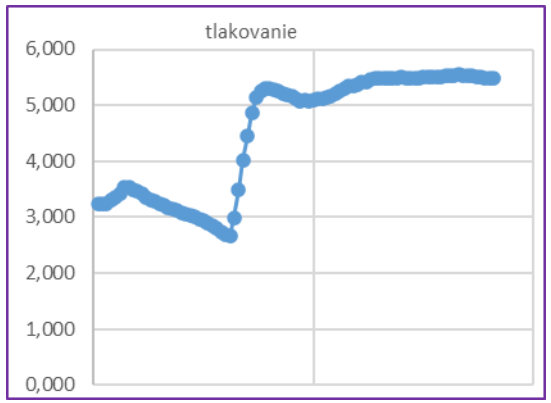
- Overheating the reactor R102.201 due to the exothermic reaction of the catalyst with air
- Cause: equipment not properly isolated, the isolation plan is missing
- Consequence: destroyed part of catalyst
- Potential consequence: reactor damage

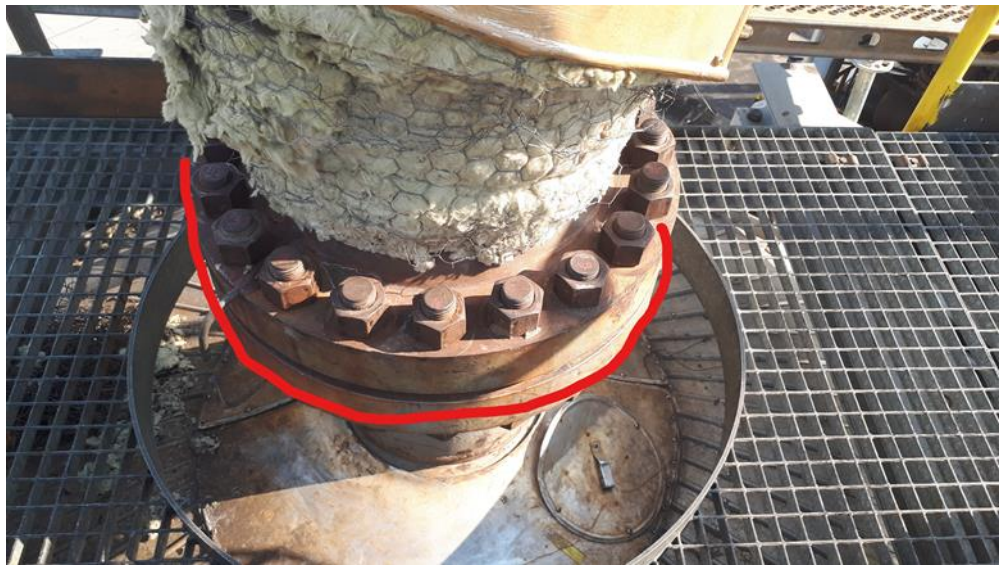


PREVIOUS INCIDENTS DURING S/D, TA and S/U after planned Maintenance

Leakage on flange of the hot separator 65H702 at Gasoil Hydrotreater unit, 24.3.2022:

- During the start-up of BGHT7 unit, a circulating gas leak occurred on the flange of the hot separator H702
- Cause: violation of start-up procedure – rate of pressure increase in high pressure loop
- Consequence: no higher loses due to planned lower production in Refinery in the given period





LIFE SAVING RULES

USE ALL REQUIRED PPE AND EQUIPMENT FIT FOR PURPOSE

Always use all prescribed PPE and check their functionality before usage

LIFE SAVING RULES

FOLLOW SAFE LIFTING RULES

Never work under a suspended load. Avoid touching lifted load with hands. Only qualified personnel can operate lifting appliances.

LIFE SAVING RULES

(VIDEO) - Hydrogen Production Plant, two days before end of TA 2024

- contractor employee was performing work OUSTIDE OF the PROTECTIVE FENCE,
- risk from FALLING FROM HEIGHT, on or next to staircase
- worker didn't us personal protective equipment for working on heights, FALL ARREST SYSTEM nor any other method of belaying at height
- during his unsafe walk, he was STANDING ON FINGERTIPS, at any time there was a risk of slipping and falling

Note:

From the interview with the said worker, it emerged that today is his last day of work, and he will be retiring next month.

CHRONIC UNEASE

BEING **ALERTNESS TO WEAK SIGNALS** AND TO MIND TRAPS

RESETTING OUR TOLERANCE TO RISK AND UNDERSTANDING THAT SMALL FAILURES ARE SIGNS THAT SOMETHING NEEDS FIXING

ASKING THE RIGHT QUESTIONS AND PICKING UP ON SIGNALS OF POTENTIAL FAILURE WHEN ON SITE

TRAINING PILOTING AND ROLLOUT

- Developed and piloted in Production Slovnaft in March and April 2023 before the Spring T/A 2023 event
- Trainings focused on shift leaders and daily staff of process units which were in Spring T/A 2023 scope.
- In 2024 extended to Plant managers, TA and Investment Project managers, Process technologists and Inspection, Reliability and Field Maintenance engineers – **20% of site personnel was trained**
- Training material is continuously developed
- Training was rolled out to all MOL Group DS Production sites and is now considered as a standard pre-TA practice

DURING TA AND TECH. S/D IN Y2023 AND Y2024 NO LTI WAS RECORDED

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THANK YOU FOR YOUR ATTENTION !