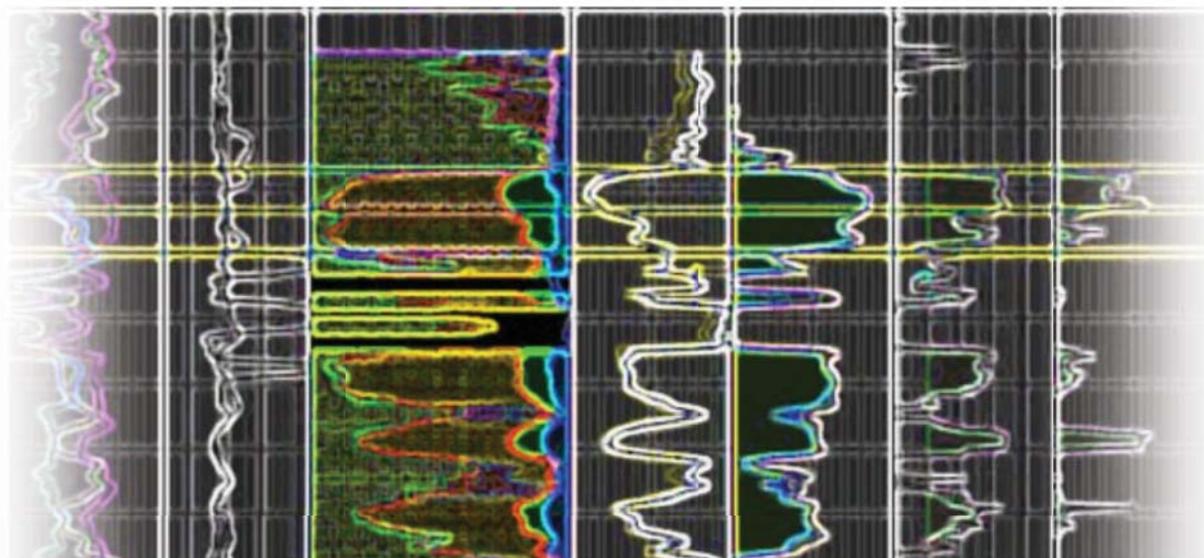


The Newsletter

December 2020



21st January 2021

New Technology Webinar

Newsletter Content

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From the President



Dear Members and Friends of the LPS,

Happy New Year to all! Let us look forward to the opportunities and challenges of 2021, whatever those might be.

Our December Seminar, 'Professor Paul F. Worthington: Commemorative Webinar' proved to be a very special event. This was held virtually on the 10th and 11th of December and paid tribute to Paul's outstanding contributions to Petrophysics. Many thanks to the speakers and particularly to Brian Moss who guided an excellent discussion on the Friday morning on the direction of Petrophysics. You can read more about the conclusions later in this newsletter. If you missed some of the seminar all members will have received a link to download both the slides and recordings from both days.

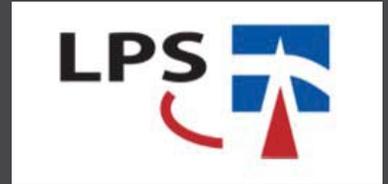
As discussed in the last newsletter our annual President's Evening has had to be cancelled, so let me take the opportunity now to again thank Dawn Houlston for her leadership of the LPS during the past two years. We are also lucky to have a large team of willing volunteers to run the society, so many thanks to those who have volunteered to assist in running the committee. If anyone reading thinks they might like to serve in the future running of the LPS, then you have until next November to put your name forward.

2021 starts with our free to attend New Technology Seminar on Thursday 21st January which will be held virtually. There will be an online registration, but it will again be free of charge, supported by our sponsors. We have a great selection of talks, and abstracts will be sent around shortly. As in previous years it remains a good source of information on the latest developments in Petrophysics.

Season's greetings to all,

Ian

Upcoming LPS Events



As we get ready for 2021, we would like to highlight that our event calendar remains unchanged and that we are looking for speakers for our evening lectures and seminars.

If you would like to participate or suggest someone, please do get in touch.

The dates of the events are posted below for your reference.

<u>DATE</u>	<u>EVENT</u>	<u>COMMENT</u>
21-01-21	Seminar	New Technology Seminar
09-02-21	Evening Lecture	
11-03-21	Seminar	Seminar: Petrophysics 101
20-04-21	Evening Lecture	
11-05-21	Evening Lecture	
17-06-21	Seminar	
13-07-21	Evening Lecture	
16-09-21	Seminar	
12-10-21	Evening Lecture	
16-11-21	Evening Lecture	AGM & Off-topic talk
09-12-21	Seminar	

Upcoming LPS Events



On Thursday 21st January the London Petrophysical Society will be holding a half-day New Technology webinar online.

The seminar will consist of a series of themed talks, on petrophysical and formation evaluation technologies that are new to the industry each lasting around 20 minutes.

Here are some of the topic that will be covered:

- Hydrophilic Logging Tool by Hydrophilic
- CoreDNA system by EPSLog
- Fibre Optic Sensing for Production Profiling case study by Silixa
- Automated workflows for sonic measurements by Schlumberger
- Integrated cuttings characterisation methods case study by Ingrain (Halliburton)
- Reservoir navigation case study by Baker Hughes
- Optimized petrophysical inversion method by CGG
- Cuttings volatiles analyses for reservoir assessment by AHS (Advanced Hydrocarbon Stratigraphy)

Free to attend online, more details to follow in the upcoming weeks.

Highlights from Past Events



Prof. Paul F. Worthington Commemorative Seminar

10th -11th December 2020

Synopsis of Panel Discussion

B. Moss, Panel Chairman

NB The panel were providing commentary in a personal capacity - opinions expressed are their own and do not represent official views of the LPS, SPWLA, or of the organisations of which they are part (or of which they have recently been a part).

The panel comprised:

Martin BLUNT	Imperial College, London (Physicist; worked with BP, then at Stanford and latterly, 20 years as Professor of Petroleum Engineering at Imperial)
Don CLARKE	ExxonMobil International Ltd (20 years in petrophysics with Exxon, previously SLB petrophysicist)
Michel CLAVERIE	Formerly with Schlumberger Wireline (as Technical Director of Petrophysical Interpretation)
Alan JOHNSON	Consultant (Formerly with Shell in several roles including Petroleum Engineer and Petrophysicist; previously with smaller oil companies)
Mike LOVELL	Leicester University (Professor of Petrophysics; Research includes conventional and unconventional reservoirs, as well as ocean drilling together with 20 years experience delivering industry petrophysics courses)
Brian MOSS	Consultant (formerly at Schlumberger in commercial software division; previously analytical consulting, software and business development roles)
Tim PRITCHARD	Formerly with BG Group (as Head of Petrophysics; now part-time research Professor with Leicester University)

The course of the discussion was organised within three broad poles or themes:

1. Business
2. Technology
3. People



Prof. Paul F. Worthington Commemorative Seminar

10th -11th December 2020

Synopsis of Panel Discussion

B. Moss, Panel Chairman

1. BUSINESS

Is the discipline of petrophysics seen as merely transactional, or is it viewed as an inclusive, integrative, and broad-based discipline contributing across many business lines beyond basic formation evaluation?

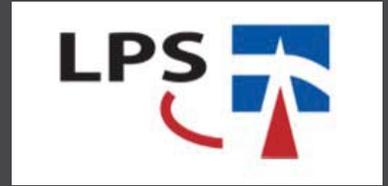
The Bridgehead model of Paul Worthington is very apt – act as an interface (broad-based and integrative) between disciplines, but increasingly getting squeezed into being purely transactional, often through budget constraints. Breaking out of this view is a ‘long slog’.

Field studies are frequently designed as a linear process, with petrophysics done transactionally near the start. Then, for budget reasons and/or due to being provided by third-party consultancies, the petrophysicist is removed from the project and does not participate in the later, iterative refinement stages for the project model (s). Opportunities to see the broader value provided by petrophysical data can thus be missed.

Service companies are required to keep transactional, but nevertheless usually keep the success of the project for which they provide the service as a close interest – though generally not at the same level as does the field Operator.

Teaching of petrophysics is now tending to include the business impact element of the discipline. Trying to introduce the broad-based inclusive worth at an early stage. Petrophysics has an inherent difficulty with that breadth – defining what constitutes petrophysics can be tricky to do in a clear fashion.

Highlights from Past Events



Research addresses the processes that control fluid flow in pore systems. Advances in numerical modelling and imaging bring huge benefits to understanding; Machine Learning tools help to make sense of the large amounts and disparate types of data collected.

The promotion of petrophysics more widely and proactively as an integrative discipline, as opposed to being principally transactional, can be a useful aim of the overarching industry bodies such as SPWLA and LPS (and other regional societies). Opinion was expressed that the Houston Board was failing to develop a long-term strategy for the business of petrophysics, probably on account of its structure that comprises short-term tenures leading to frequent changes in emphasis.

Within companies, petrophysics management is where discipline promotion should occur – analytical petrophysicists are often too busy with the day job to spare time for discipline promotion in the organisation.

Adopting less adversarial and more inclusive approaches, both within the larger organisations and between the operators and the service companies and other researchers, would pay dividends. Certainly, the ‘departmental silo’ approach is seen as detrimental to getting the best out of petrophysical data.

Being clear as to the value added and the monetary impact of uncertainty on the project – defining what is possible and what is not possible among geoscience options, for example – are considered useful ways in which to promote the broader value of the discipline within companies.

Undoubtedly, the oil industry has shrunk, budgets are squeezed and petrophysics in larger companies shifts towards becoming transactional. But is that principally a phenomenon in particular regions, such as Europe and North America? In other parts of the world, e. g. in the Middle East, China, Russia, the Caribbean and South America, the practice of petrophysics is more vibrant and forward looking.

Highlights from Past Events



Prof. Paul F. Worthington Commemorative Seminar

10th -11th December 2020

Synopsis of Panel Discussion

B. Moss, Panel Chairman

2. TECHNOLOGY

The question was posed: "Is anything missing from our technological 'armoury'?"

The answer was a pleasing "Not much", but it was concluded that we could be doing more with the technology that we have at our disposal. Our technology is very broad, leading to difficulties for non-specialists to position or define our contribution. This plays back to the shape of the petrophysics 'business' or discipline, in that the value added from our data generally needs to be better promoted, which would lead to more applications of the high-end data.

The thin bed issue is still a challenge especially in relation to the dynamic contribution of those thin beds to production. Combining testing tools and static analysis can bring the dynamic and the static models together to make better, dynamically based, predictions, especially in well and reservoir monitoring. Scale reconciliation is a concern here.

Readings from either beyond the invaded zone or very soon after the bit has penetrated the formation to minimise invasion effects/damage are key. Multi-sensor modelling and combining sonic logging to seismic data could be brought to bear to study deep into the formation.

Depth control, especially TVD in producing fields under monitoring, could be strengthened. LWD and sensors' conveyance have dramatically improved over the years allowing any type of well geometry to be efficiently surveyed.

Multi-mineral components can prove a challenge to incorporate into models.

Highlights from Past Events



Make better use of the older generations of log data – mature basins mostly comprise these data, as do publicly available databases in N. America. Integration and reconciliation of these data to newer data suites can be challenging.

A direct measure of fluid movement properties would be nice. Here the leading edge is to investigate combinations of techniques – e. g. using acoustics to perturb the fluids sensed by NMR to assess permeability. “Electro-acoustic” investigations are under way in universities but seem to work better in the laboratory than in the field just now.

“Big data” is held to be quantified as the number of wells, in West Siberian fields, for example, or within individual formations in a mature basin such as the North Sea.

Rich and complex downhole array data and time-lapse monitoring from remote sensors produce voluminous data sets that require specialised software to handle them.

Data management is key. Machine Learning principles have been with us for decades. What they are firmly predicated upon is good quality data – here there is an expectation from outside the petrophysics sphere that ML methodology in general will always sort the good from the bad data and discard the latter whilst deriving the target model - but does it do that today, really? Data management seems always a target for cuts when budgets get trimmed, but its importance is without question. Developing ML methods that help in this task of data validation would be very useful.

Management of expectations about the capabilities of ML is necessary – “Machine Learning” is seen to be something of a panacea in some quarters and a route to minimising cost.

However, today’s ML tools are not considered by the panel to be ready for doing that yet.

Is ML a friend or foe to petrophysics? ML is a tool, not a replacement analytical technique. If correlations exist, then [we] need to ask why and derive the physical model underlying to obtain understanding. It can be a friend if harnessing the techniques extends the utility of petrophysical data – digitalisation of the oilfield involves processing “at the edge” (the wellsite) for instant use of complex processed data from the cloud by all interested parties – this could be a good area for the application of ML. Same for data validation. However, it could become more of a threat if ML is forced onto the petrophysical discipline through unrealistic expectations related to “Artificial Intelligence” applications.

Highlights from Past Events



Prof. Paul F. Worthington Commemorative Seminar

10th -11th December 2020

Synopsis of Panel Discussion

B. Moss, Panel Chairman

3. PEOPLE

If the discipline is viewed as merely transactional, this will discourage entry by younger folk as it will not be seen as providing an enticing career. The reality is the complete opposite – the job of a petrophysicist is different every day and entails a broad spectrum of skills, so that a career could take many directions. Providing the teaching curriculum to reinforce this is challenging, due in part to the breadth of the subject. However, no dedicated petrophysical undergraduate course exists (except possibly in China, to be confirmed); emphasis for undergraduates should be on basic skills and understanding fundamental processes. Attempts to define a petrophysics undergraduate syllabus could not finalise one. Practical petrophysics is taught at Master's level but does it go wide enough for today's challenges?

Mentoring as a means of continuous training and career support are seen to be a crucial means to provide training and guidance to younger staff, especially for smaller companies where training relies on external industry courses, and learnings can be lost if not applied in entirety. Suggestion for a role for SPWLA to formalise a system of mentoring, though with due regard to the SPE experience, relayed by Alan Johnson, where it was found that active management of the mentor/mentee relationship is required to avoid it becoming just a forum where mentees primarily use prospective mentors as job-seeking opportunities.

Larger companies can manage continuous training better than can smaller ones – the old days where larger companies would require one-year long training programmes before becoming a petrophysicist are gone, but with larger staffs they have greater flexibility to provide in-house mentoring, though it is suggested this is not provided by line management to avoid questioning stances by mentees being detrimental to careers. It is essential that outside mentors are also available, especially for smaller companies.

Highlights from Past Events



Inclusion of ML principles, soft skills/people skills and exposure to 'adjacent' technologies such as computing, seismic and/or reservoir engineering are all useful ideas to extend the training of petrophysicists.

In 2014 a 3-day Topical Conference on "Educating the petrophysicist" was held. 50 attendees from all parts of the discipline made several recommendations, including:

- Establish a programme for support of mentoring;
- Establish tutorials (taken up by SPWLA, building on earlier published tutorials);
- Creation of an Education Subcommittee (since evolved into a SIG);
- Recording Distinguished Speaker presentations for wider distribution;
- Importance of effective communication skills, along with good grounding in geoscience;
- SPWLA should form a joint-industry project to develop virtual training, with attention paid to mitigate its drawbacks, such as lack of contact between student and lecturer and difficulties over practical work sessions. Open access datasets would help, as would better access to specialised software. Fieldwork should not be ignored either.
- Attempts to define a syllabus

Petrophysics has applications beyond oil and gas industry. Training and exposure to processes and issues related to geothermal, carbon-capture-underground-storage, or even foundation assessment for wind farms could be added to petrophysicist training topics.

Continuous training for individual consultants outside companies is important, too. They need to keep abreast of the latest technologies, and non-standard evaluation techniques, but self-study of symposium papers is seldom up to the task of obtaining complete training. How to do this cost effectively is the challenge, but important in order that this community can help promote the latest technology and evaluation methods.

Highlights from Past Events



Prof. Paul F. Worthington Commemorative Seminar

10th -11th December 2020

Synopsis of Panel Discussion

B. Moss, Panel Chairman

4. SUMMING REMARKS

The discussion tried to touch on big things in two hours – 6 years ago 50 people spent 3 days on just one of the three big themes.

LPS could take some lead in following up – e.g. A day seminar on uses of petrophysics outside oil and gas, for example.

Business – the onus is on the petrophysics community to try to promote itself as integrative to divert the seemingly inexorable drift into being purely transactional.

Technology – make better use of what is available – jaw-dropping technology. Quite comforting that nothing is completely missing as regards addressing issues of characterising pore systems.

People - It would be good to pursue the themes on mentoring – how to organise this and how to avoid traps. Also training expansion online.

Other Events



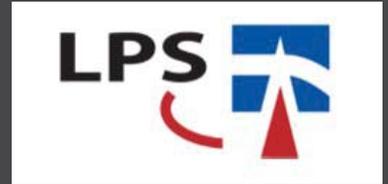
- SPWLA Webinars:

https://www.spwla.org/SPWLA/Events/Event_List/SPWLA/Events/EventListRoster.aspx?DisplayAreaOptions=No&hkey=0e68d4af-78df-4ed2-8bd2-79ddc7cf4411

- PESGB Virtual Events:

<https://www.pesgb.org.uk/upcoming-events/>

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Call for Papers



A message from the LPS Technical Editor Kanad Kulkarni:

Call for LPS Newsletter Articles

We would like to invite members and friends of the LPS to submit technical articles for future editions of the LPS Newsletter.

The LPS Newsletter welcomes submissions in a range of flexible formats such as a short story/article/announcement that fall within the following structures:

- **Technical Innovation News:** The LPS will include a section specifically allocated to short, topical, innovation-oriented news. This can be a paragraph or an extended abstract format to share with the community newly developed methods, tools, and newly registered patents. The objective is to disseminate the information to all interested parties within the LPS community and beyond. Innovation encompasses new designs or methods, with the ultimate objectives of better solutions to meeting needs, or realising a goal in a new technique. The innovations are key to providing industrial and academic teams with a competitive edge, and part of the process of innovation is to make end users and competitors aware of what is new. The LPS would like to contribute to promoting innovative ideas and processes through the newsletter communication.
- **Major Articles:** In depth articles discussing topics of interest. Such articles can involve a review of a particular subject or can address and discuss a specific method, tool, or an academic study finding. For example, articles may discuss the implementation experiences, implementation efforts of a tool or a method, and uncertainties in the outcome and areas for improvements
- **Short Notes Articles:** These can be preliminary findings of academic and industrial R&D projects related to petrophysics, rock physics and rock mechanics. These short notes can be in the format of an extended abstract.
- **Educational Material:** This may include introducing a topical subject to the wider community. For example, there is a lot of discussions on Artificial Intelligence application in geosciences including petrophysics, rock physics etc. An article that describes the basic principles, historical background and current state of the art and challenges would be appropriate and timely.

The contribution formats

Articles should be submitted in Word format and with embedded figures.

Word count:

Technical Innovation News: up to 500 words, and up to 4 figures/illustrations

Major Articles: up to 3000 words and up to 15 figures/illustrations

Short Notes Articles: up to 1500 words and 8 figures/illustrations

Educational Material: up to 3000 words and up to 15 figures/illustrations

If anybody wants to contribute with material which has been previously published the LPS Editor requires approval of the original article author (s) and the publisher and a Word version of the article without graphics.

Call for Papers



Why publish in the LPS Newsletter?

Articles submitted to the newsletter will benefit from rapid publication and flexible format. Furthermore, sharing technical innovation news give the inventors/service providers/researchers the exposure to potential end users and help in completing the innovation process into implementation and testing opportunities.

The deadline

Contributions should be sent to **the LPS Technical Editor by email**. Articles will be published on first come first serve basis subject to suitability of the article and readiness for publication with no editorial issues.

Frequency of publication

Accepted contribution for publications will be published in the monthly LPS newsletter.

The license and copyright

By submitting a contribution to the newsletter, you agree that the text which appears in the newsletter will be publicly available.

How to submit?

To submit a contribution to the newsletter please send your material at the first instance in a compressed pdf file format to the Technical Editor of the LPS: **kanad.kulkarni@gmail.com**

All submitted material should have the full names and affiliation and contact details for the authors with an indication as to who is the corresponding author.

It is the responsibility of the author to get permission for the publication of material from their organization and third parties. LPS assumes that such permission is obtained before the material is submitted.

Commerciality should be avoided, and while preparing the material for publication the author should avoid any offense to others.

Templates for articles will be available on request from potential contributors.

Contact for queries/clarifications:

If you have further information/queries please contact:

The LPS Technical Editor, M. S. Ameen by email: kanad.kulkarni@gmail.com

SPWLA Membership



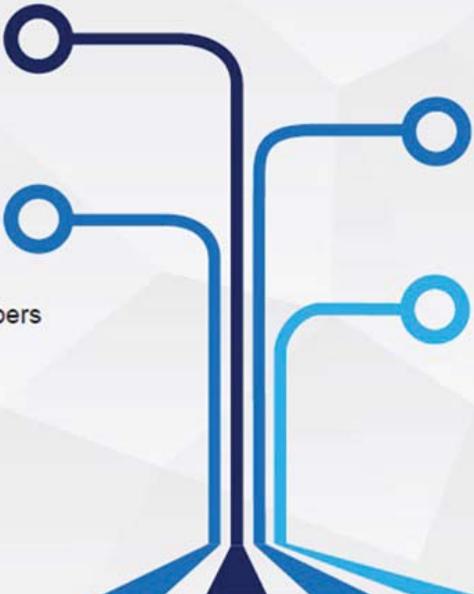
SPWLA has played a major global role in strengthening petrophysical education and strives to increase the awareness of the role petrophysics has in the oil and gas industry and the scientific community.

The LPS is a chapter of SPWLA and we encourage you all to become members of our parent organisation and join the "Home" for Formation Evaluation and Petrophysics.

Remember that professional and student membership has many benefits including;

- The Petrophysics Journal
- The new SPWLA Newsletter magazine
- Access to online literature resource
- Discounted registration for two "Topical Conferences" each year
- Access to monthly Webinars
- Access to and use of training facilities located in Houston
- Discounted registration for the Annual Symposium and its associated short courses

SPWLA Membership Type. Join at www.spwla.org



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- Full SPWLA benefit.

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- \$40/year.
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- Only for low income members (<40k USD/year).

STUDENT

- \$15/year with limited free membership sponsored by Baker Hughes.
- Full benefit except voting in professional chapter and international organization.

CHAPTER AFFILIATE

- Free.
- Attending local chapter meetings.
- Only local chapter benefit.



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The Technical Committee 2021



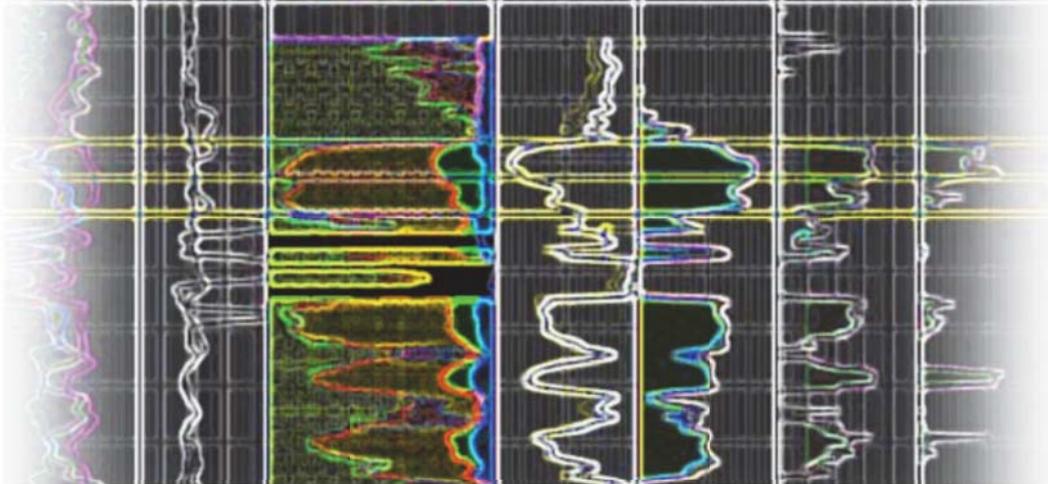
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**Newsletter
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Kanad Kulkarni

The Newsletter

December 2020



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Feedback to Ruza.Gagnon@intl.cnoccltd.com