#### **EUROPEAN STRUCTURAL INTEGRITY SOCIETY**

## MINISTRY OF EDUCATION AND SCIENCEOF UKRAINE TERNOPIL NATIONAL IVAN PULUJ TECHNICAL UNIVERSITY

## G.S. PISARENKO INSTITUTE FOR PROBLEMS OF STRENGTH THE NATIONAL ACADEMY OF SCIENCES OF UKRAINE

KARPENKO PHYSICO-MECHANICAL INSTITUTE
OF THE NATIONAL ACADEMY OF SCIENCES OF UKRAINE

**UKRAINIAN SOCIETY ON FRACTURE MECHANICS** 

#### VIRTUAL INTERNATIONAL CONFERENCE



"IN-SERVICE DAMAGE OF MATERIALS, ITS DIAGNOSTICS AND PREDICTION"

"VDMDP1"

October 11-13, 2021 Ternopil, Ukraine

October 11-13, 2021, Ternopil, Ukraine

### **International program committee**

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Co-Chairmen of the Program Committee	Kharchenko V.V.	/Ukraine/
Co-Chairmen of the Program Committee	Nazarchuk Z.T.	/Ukraine/
Chairmen of the Organizing Committee	Iasnii V.P.	/Ukraine/
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Anatoly	Zinkovskii	Ukraine	Olha	Zvirko	Ukraine

#### **CONFERENCE SCHEDULE**

Date	Time	Formal events	Room (link)
	14.00-14.20	Opening of the Conference	<u>Hall</u>
11 / 10 / 2021,	14.20-19.00	Session 1	Room A
Monday (by Kyiv, GMT+3)	14.20-19.00	Session 2	Room B
	14.20-19.00	Session 3	Room C
	14.20-19.00	Session 4	Room D
12 / 10 / 2021, Tuesday	15.00-16.45	TC 10 Meeting	Room A
(by Kyiv, GMT+3)	17.00-18.45	TC 13 Meeting	Room B
	14.00-17.20	Mini-symposia Hydrogen Degradation	Room A
13 / 10 / 2021, Wednesday (by Kyiv, GMT+3)	14.00-18.00	Mini-symposia Technogenic and Environmental Risks in the Energy Sector: Estimation, Forecasting, Prevention	Room B
	18.00	Closing of the Conference	<u>Hall</u>

VDMDP1 is held online using the Google Meet platform.

Participants will be able to join rooms 15 minutes before the scheduled start time



# LOCALIZED AND NONLOCALIZED DAMAGE OF MATERIALS DAMAGE PREDICTION METALLOGRAPHY AND FRACTOGRAPHY

#### 11 / 10 / 2021, Monday

- Se	ession 1-	Co-chairmen:	Student O., Lesiuk G.	
14.20	M.P. De J MAINTE	esus	M., Urbanowicz K., Jose A.F.O. Co UCTURAL DEGRADATION OF T E STEEL	,
14.40			S., Belokon Yu. ROUS CONSTRUCTIONS HEAT	TRANSFER
15.00	1 -	D., Korniy S., Zin I. UM ALLOY CORR	OSION INHIBITION BY GRUDI	E GLYCEROL
15.20	MATERIA		ramar H., Shynhera N., Shved Ya. N OPTIMIZATION OF A WELD. PROFILES	ED RAFTER
15.40	CONTAC	· · · · · · · · · · · · · · · · · · ·	ala V., Senyuk O., Lozovan V. OF INSULATION DAMAGES DI PIPELINES	STRIBUTION
16.00		T PHENOMENA B ERS WITH STRON	BETWEEN SOFT ELASTOMERS IG ADHESION INTERACTION I	
16.20			Coffee Break	
16.40	DEFORM	•	, Maylo A., Pisarenko S. <b>S OF THE STRUCTURAL MATE</b> .	RIAL AS A

October 11-13, 2021, Ternopil, Ukraine

	Andreykiv O., Babii A., Dolinska I., Yadzhak N., Babii M. RESIDUAL LIFETIME PREDICTION OF FIELD SPRAYER BOOMS
<i>17.00</i>	UNDER THE ACTION OF MANEUVER LOADING AND CORROSIVE
	ENVIRONMENTS
	Krechkovska H., Sylovanyuk V., Student O., Chornenkyi A.
17.20	PREDICTION OF THE STATE OF HEAT-RESISTANT STEEL FOR A
17.20	STEAM PIPELINE TAKING INTO ACCOUNT CHANGES IN ITS
	STRENGTH DUE TO OPERATIONAL DAMAGES
	Bodrova L., Kramar H., Koval I., Marynenko S., Kovalchuk Ya., Prysyazhnyuk
17.40	P., Shlapak L.
17.10	INFLUENCE OF NANO-NI ON THE MICROSTRUCTURE OF
	POLYCARBIDE-BASED ALLOYS
18.00	Toribio J.
	ON THE NOTCH TIP STRAIN RATE
10.00	Dzioba I., Lipiec S.
18.20	ANALYSIS OF THE FRACTURE PROCESS IN FERRITIC STEELS
	BASED ON A UNIAXIAL TENSILE TEST
18.40	Toribio J.
	ON THE CRACK TIP STRAIN RATE
	Kharchenko V.V., Katok O.A., Kravchuk R.V., Sereda A.V., Shvets V.P.
19.00	ANALYSIS OF THE SITUATION AND FEATURES OF METHODS FOR
19.00	DETERMINATION OF STRENGTH CHARACTERISTICS OF NPP MAIN
	EQUIPMENT METAL FROM THE RESULTS OF HARDNESS AND INDENTATION MEASUREMENTS
	Ignatovich S., Yutskevych S., Makarov I.
19.20	FEATURES OF AIRCRAFT STRUCTURES CORROSION DAMAGE
19.20	DURING STORAGE UNDER COVID-19 RESTRICTIONS
	PUMING STORAGE UNDER COVID-17 RESTRICTIONS



#### **DAMAGE DIAGNOSTICS**

11 / 10 / 2021, Monday

- Se	ession 2 -	Co-chairmen:	Yuzefovych R, Zinkovskii A.	
14.20	NOTCH-7	TYPE SURFACE D	nyshchenko Ye., Savchenko K. DAMAGE INFLUENCE ON THE F E OF THE COMPOSITE CANTILI	_
14.40			RESS-STRAIN STATE OF A CYLII ON OF FORCED OSCILLATIONS	NDRICAL
15.00	STUDY 6		eliak R. <b>WORK OF THE FOUNDATION</b> <b>THE ACTION OF DYNAMIC LOA</b>	
15.20			Gavrylov Ie., Pejkowski Ł., Seyda J. T <b>ONITORING FOR LIGHT AIRCR</b>	<b>AFT</b>
15.40	REASON ARC STE	S OF METAL DEG ELMAKING FURN	I., Lukianchenko E., Kozulin S. GRADATION OF COPPER CHAMI NACES DURING OPERATION AN R RESTORATIVE REPAIR	
16.00	Toribio J. SCULPTU	URE AND FRACTI	URE MECHANICS	
16.20			Coffee	
16.40	THE INF DEFECT	OF THE LAYER	ymov A. LICON AND ALUMINUM CONTA R OF HIGH-CHROMIUM CAST E MANUFACTURE OF BIMETAL	IRON THAT

	Stankevych O., Skalskyi V., Klym B., Velykyi P.
17.00	IDENTIFICATION OF FRACTURE MECHANISMS IN CEMENTITIOUS
	COMPOSITES USING WAVELET TRANSFORM OF ACOUSTIC
	EMISSION SIGNALS
	Javorskyj I., Yuzefovych R., Lychak O., Matsko I., Semenov P.
17.20	EVALUATION OF THE MECHANISM DAMAGE USING MODEL OF
	VIBRATION SIGNAL AS A PERIODICALLY CORRELATED RANDOM
	PROCESS
	Maylo A.
	STATISTICAL CHARACTERISTICS OF THE RELIEF OF
<i>17.40</i>	DEFORMATIONAL DEFECTS OF THE SURFACE OF A METAL
	POLYCRYSTAL AT THE FATIGUE AS A FACTOR OF OPERATIONAL
	AGING OF A STRUCTURAL MATERIAL
	Paweł Stabla, <u>Szymon Duda</u> , Paweł Zielonka, Grzegorz Lesiuk
18.00	REVIEW OF MONITORING TECHNIQUES OF COMPOSITE BARS AND
	ANCHORAGE SYSTEMS
	Błażejewski W., Barcikowski M., Stosiak M., Lesiuk G., Lubecki M., Stabla P.,
18.20	Smolnicki M., Bury P., Towarnicki K., Warycha J., Duda Sz.
10.20	ACOUSTIC EMISSION AND STRAIN MONITORING OF COMPOSITE
	PRESSURE VESSEL WITH ASYMMETRIC DOMES IN PRESSURE TEST
	Stosiak M., Lubecki M., Lesiuk G., Urbanowicz K.
18.40	DIAGNOSING CAVITATION IN HYDROSTATIC SYSTEMS USING AN
	ACOUSTIC SIGNAL
	Totosko O., Stukhlyak P., Dolgov N., Zolotiy R., Stukhlyak D.
19:00	INVESTIGATION OF CORROSION RESISTANCE OF TWO-LAYER
	PROTECTIVE COATINGS
	Prysyazhnyuk P., Ivanov O., Matvienkiv O., Marynenko S., Korol O., Koval I.
19.20	IMPACT AND ABRASION WEAR RESISTANCE OF THE
17.20	HARDFACINGS BASED ON HIGH-MANGANESE STEEL REINFORCED
	WITH MULTICOMPONENT CARBIDES OF TI-NB-MO-V-C SYSTEM



## CRACK INITIATION AND PROPAGATION LIFETIME CALCULATIONS OF MECHANICAL COMPONENTS

11 / 10 / 2021, Monday

- Se	ession 3 -	Co-chairmen:	Yasniy O., Kondryakov E.	
14.20	NUMERIO AND FRA	CAL SIMULATION CTURE OF HIGH	E., Katok O., Kravchuk R. N OF THE PROCESSES OF DEF I-STRENGTH MATERIALS DUR TION OF THIN PLATES	
14.40	EXPERIM AND FRA	MENTAL AND CAR	E., Kravchuk A., Kotliarenko A. LCULATIONAL STUDIES OF DE SES OF VARIOUS TYPES OF ST TESTS	
15.00	Toribio J. TOWARD RICE	S A NEW CONCE	PT OF CRACK PATH: A TRIBUT	TE TO JIM
15.20	•	LUENCE OF TOO	OL TRAVERSE SPEED ON THE L F AZ31 FRICTION STIR WELDE	
15.40	Romashko V., Romashko-Maistruka O. LEVEL FORMATION AND DISCLOSURE OF NORMAL CRACKS IN REINFORCED CONCRETE ELEMENTS AND STRUCTURES			
16.00		Yasniy O., Fedak S. T <b>ION OF JUMP-LI</b>	., Lapusta Yu. KE CREEP USING PRELIMINA	RY PLASTIC
16.20			Coffee Break	
16.40	Stashkiv M MATHEM	1. IATICAL MODEL	urskyi M., Baranovsky V., Shelestov.  FOR ESTIMATING SIF K <sub>1</sub> DUR.  DENTICAL SURFACE CRACKS	

	O. Kononchuk, V. Iasnii, N. Lutsyk
17.00	PREDICTION OF REINFORCED CONCRETE STRUCTURES BEHAVIOR
	USING FINITE ELEMENT METHOD
	Toribio J.
17.20	A MODIFIED PARIS LAW APPROACH TO FATIGUE CRACK GROWTH
	IN COLD DRAWN PEARLITIC STEEL
	Belodedenko S., Hanush V., Hrechanyi O.
<i>17.40</i>	FATIGUE LIFETIME MODEL UNDER A COMPLEX LOADING WITH
	APPLICATION OF THE AMALGAMATING SAFETY INDICES RULE
	Pidgurskyi I., Stashkiv M., Pidgurskyi M., Rudyak Yu., Ripetskyi Ye.,
	Ripetskyi R., Lazaryuk V.
18.00	PREDICTION OF RESIDUAL DURABILITY OF STRUCTURAL
	ELEMENTS WITH IDENTICAL SURFACE CRACKS TAKING INTO
	ACCOUNT THE STAGE OF THEIR COALESCENCE
	Yasniy P., Okipnyi I., Dyvdyk O., Rudawska A., Senchyshyn V.
18.20	RESIDUAL LIFETIME PLATES WITH PREEXISTING CRACK NEAR
	COLD EXPANDED HOLE
	Dolgov N., Stukhlyak P., Totosko O., Chykhira I.
18.40	INVESTIGATION OF THE DELAMINATION OF EPOXY COMPOSITE
	COATINGS UNDER THE ACTION OF NORMAL AND SHEAR STRESSES
	Justyna Ławrecka, Michał Barcikowski, Szymon Duda, Grzegorz Lesiuk
19.00	DOUBLE CANTILEVER BEAM TEST FOR ASSESSMENT OF
17.00	FRACTURE TOUGHNESS OF BI-DIRECTIONAL GLASS FIBER -
	MODIFIED EPOXY RESIN LAMINATES
	Babii A., Dovbush T., Khomuk N., Dovbush A., Tson A., Oleksyuk V.
19.20	MATHEMATICAL MODEL OF A LOADED SUPPORTING FRAME OF A
	SOLID FERTILIZERS DISTRIBUTOR



#### STRENGTH AND RELIABILITY OF COMPONENTS 11 / 10 / 2021, Monday

- Se	ession 4-	Co-chairmen:	Lapusta Yu., Iasnii V.	
14.20		NG FRACTURE MI NISH EXPERIENC	ECHANICS AND STRUCTURAL INTEGR CE	PITY:
14.40	FINITE E	,	vu., Iasnii V. SIS OF REINFORCED-CONCRETE BEAL LLOY UNDER THE BENDING	M
15.00			, Gomon S. S., Gomon P., Savitskiy V.  OF CHEMICALLY MODIFIED SOLID	
15.20	Gomon S.S., Gomon P., Homon S., Polishchuk M., Dovbenko T., Kulakovskyi L. IMPROVING THE STRENGTH OF BENDING ELEMENTS OF GLUED TIMBER			
15.40	RESEAR	CHING OF THE ST CING BASED ON	Thlapak L., Marynenko S., Bodrova L., Krama TRUCTURE AND PROPERTIES OF FCA FE-TI-MO-B-C WELDED UNDER LOW	
16.00	Voloshyna <b>DETERM</b>	L.	alia G., Ustenko O., Lovska A., Rybin A.,  ADING OF A HOPPER CAR WITH AN  HE SPINE BEAM	
16.20			Coffee	
16.40	DETERM		a V., Berestovoi I. NAMIC LOADING OF A TANK WAGON W VEEN THE POT AND THE FRAME	VITH

- COCCESSOR October 11-13, 2021, Ternopil, Ukraine

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#### TC 10 MEETING Environmentally Assisted Cracking and Hydrogen Embrittlement

12 / 10 / 2021, Tuesday

- Session - Co-chairmen: Nykyforchyn H., Toribio J.

*15.00-16.45* 

**TC 13 MEETING** 

12 / 10 / 2021, Tuesday

- Session - Co-chairmen: Yasniy P., Marsavina L.

17.00-18.45

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#### **MINI-SYMPOSIA MEETING**

### **Hydrogen Degradation**

13 / 10 / 2021, Wednesday

- Sessi	ion MM1-	Co-chairmen:	Toribio J., Nykyforchyn H.
14.00			TEE ON ENVIRONMENTALLY ASSISTED GEN EMBRITTLEMENT
14.20	<b>EMBRITT</b>	TLEMENT OF	CTURE CRITERION FOR HYDROGEN CRACKED SAMPLES OF PEARLITIC STEEL TIP STRAIN RATE
14.40	SPECIFIC	I., Syrotyuk A., Le C <b>MECHANIS</b> ABILITY AND	
15.00	<b>EMBRITT</b>	TLEMENT OF	CTURE CRITERION FOR HYDROGEN CRACKED SAMPLES OF PEARLITIC STEEL TIP STRAIN RATE
15.20	O., Tsyruli SUSCEPT	nyk Ö. <b>TIBILITY OF CA</b> L L <b>GAS DISTRIB</b> U	L., Zvirko O., Hredil M., Krechkovska H., Student  RBON PIPELINE STEELS OPERATED IN  UTION NETWORK TO HYDROGEN-INDUCED
15.40	MICRODA EUTECTO	AMAGE IN CRA	S APPROACH TO HYDROGEN ASSISTED CKED SAMPLES OF HIGH-STRENGTH STEEL: RESEMBLING MICHELANGELO KTURE



## Technogenic and Environmental Risks in the Energy Sector: Estimation, Forecasting, Prevention

13 / 10 / 2021, Wednesday

- Session MM2-		Co-chairmen:	Yasniy P., Poberezhny L.	
14.00	MINIMIZA	H., Lopushnyak ATION OF CON ION FACILITI	ONSEQUENCES OF FAILURES AT OIL AN	ID GAS
14.20	Kalyn T., Popovych P., Poberezhny L., Rudyak Yu.  EVALUATION OF THE INHIBITOR EFFECT OF ASCORBIC ACID ON THE CORROSION OF STEEL 17GS IN THE ENVIRONMENT OF NS 4			
14.40	Sydorenko V., Yeremenko S., Vambol V., Vambol S., Poberezhna L. INFLUENCE OF FOREST FIRE ON ECOLOGICAL AND RADIATION SITUATION IN RADIOACTIVELY CONTAMINATED AREAS			
15.00	Chudyk I., Hrytsanchuk A., Poberezhna L., Khomyn V., Prykhodko M., Mishchuk B.  ASSESSMENT AND MINIMIZATION OF THE IMPACT OF OIL AND GAMPRODUCTION ON ENVIRONMENTAL PROTECTION AREAS			
15.20	Krechkovska H., Kulyk B., Vira B., Student O. EFFECT OF LONG-TERM OPERATION OF 17H1S STEEL OF THE MAIN GAS PIPELINES ON THE CHANGE IN ITS MECHANICAL PROPERTIES			
15.40	Ivanov O., Bortnyak O., Hryhorskyi S., Poberezhny L., Zapukhlyak N. ASSESSMENT OF THE DEGREE OF ENVIRONMENTAL POLLUTION IN EMERGENCY SITUATIONS ON MAIN OIL PIPELINES			
16.00	RISK ASSE	ESSMENT OF A	A., Poberezhna L., Markhalevych V. ACCIDENTS AT OIL AND GAS JECTS NEAR THE OOS DISTINCTION LIN	V <b>E</b>
16.20	BASED ON	ING THE DAM I THE AE MOL	MAGE OF THE POWER PLANTS MATERIA DEL OF MATERIAL DEGRADATION UND E CONDITIONS	

16.40	Yatsyshyn T., Polutrenko M., Maruschak P., Poberezhny L., Martyniuk R.
	THE CONSTRUCTION AND OPERATION OF OIL AND GASWELLS
17.00	Kryzhanivsky Ye., Grudz V., Zapukhlyak V., Poberezhna L., Melnychenko Y.,
	Stasiuk R.
	PROSPECTS OF UTILIZING UNLOADED PARTS OF NATURAL GAS
	TRANSMISSION PIPELINES IN TECHNOLOGIES OF CARBON
	DIOXIDE CAPTURE AND STORRAGE
	Zapukhlyak V., Melnychenko Y., Maruschak P., Poberezhny L., Grudz Ya.,
17.20	Drin N.
	ASSURANCE OF RELIABILITY OF GAS-HYDROGEN MIXTURE
	TRANSPORTATION IN PIPELINE SYSTEMS
17.40	Nastaran Mozaffari, Niloofar Mozaffari, Nadeem Ahmad Khan, Parveen Sihag,
	Vambol V., Vambol S.
	THE PERFORMANCE OF AL2O3-DOPED NANOADSORBENTS ON
	CARBON MONOXIDE CAPTURE: A REVIEW
10.00	
18.00	Closing of the Conference