

**SCHEDULE AND STATUS OF IRRADIATION EXPERIMENTS – A. F. Rowcliffe and
M. L. Grossbeck (Oak Ridge National Laboratory)****OBJECTIVE**

To provide an updated summary of the status of irradiation experiments for the neutron-interactive materials program.

SUMMARY

The current status of reactor irradiation experiments is presented in tables summarizing the experimental objectives, conditions, and schedule.

PROGRESS AND STATUS

In the following table, the status of each experiment is shown in the last column with the following legend:

Irradiation complete 

Irradiation in progress 

Irradiation planned

Currently, the program has five irradiation experiments in reactor; a further 9 experiments are in the planning or design stages.

**Reactor Irradiation Experiments
Summary and Schedule**

Experiment	Lead Lab	Collaborators	Responsible Person	Major Objectives	Materials	Temperature °C	Dose (dpa) or fluence	Irrad. Start	Irrad. Finish	Status
EBR-II, Reactor, ANL, Idaho Falls, ID										
COBRA 1A1	PNL	ORNL, ANL, MONBUSHO	M.L. Hamilton	Tensile and fatigue prop., Charpy impact, fracture toughness, TEM	Austenitic and ferritic steels, Fe-alloys, V, Be, low act. materials, Cu alloys, Ti-Al-SiC, C-C comp.	370, 500, 600	9	Nov-92	Apr-93	
COBRA 1A2	PNL	ORNL, ANL, MONBUSHO	M.L. Hamilton	Tensile and fatigue prop., Charpy impact, fracture toughness, TEM	Austenitic and ferritic steels, Fe-alloys, V, Be, low act. materials, Cu alloys, Ti-Al-SiC, C-C comp.	370, 400, 800	33	Nov-92	Sep-94	
X530	ANL		H. Tsai, H.M. Chung	He-effects, swelling, Charpy Impact, fracture toughness, tensile prop.	V alloys	370	5	Aug-94	Sep-94	
High Flux Isotope Reactor, ORNL, Oak Ridge, TN										
HFIR-CTR-60	ORNL		S.J. Zinkle	Flexure bars, TEM, indentation tailored ceramics	100-600	2.4E+26 n/m ²	Dec-94	Aug-95		
HFIR-CTR-61	ORNL		S.J. Zinkle P.J. Maziasz/ J.E. Pavel	Similar to HFIR-CTR-60 He effects by isotopic tailoring, tensile prop., TEM	300-600	7.20E+26	Dec-94	Aug-97		
HFIR-JP-9	ORNL		P.J. Maziasz/ J.E. Pavel	He effects by isotopic tailoring, tensile prop., TEM	300-600	57	Jul-90	Apr-94		
HFIR-JP-10	ORNL		P.J. Maziasz/ J.E. Pavel	He effects by isotopic tailoring, tensile prop., TEM	300-600	18	Jul-90	Sep-91		
HFIR-JP-11	ORNL		P.J. Maziasz/ J.E. Pavel	Similar to HFIR-JP-10			18	Jul-90	Sep-91	
HFIR-JP-12	ORNL		P.J. Maziasz/ J.E. Pavel	Similar to HFIR-JP-9			57	Jul-90	Apr-94	
HFIR-JP-13	ORNL		P.J. Maziasz/ J.E. Pavel	Similar to HFIR-JP-10			18	Jul-90	Sep-91	
HFIR-JP-14	ORNL		P.J. Maziasz/ J.E. Pavel	He effects by isotopic tailoring, tensile prop., TEM	300-600	34	Jul-90	Sep-92		

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HFR-JP-15	ORNL	JAERI	P.J. Maziasz/ J.E. Pawel	Similar to HFR-JP-9	—	—	57	July-90	Apr-94	—
HFR-JP-16	ORNL	JAERI	P.J. Maziasz/ J.E. Pawel	Similar to HFR-JP-10	—	—	18	July-90	Sep-91	—
HFR-JP-17	ORNL	JAERI	M.L. Grossbeck/ J.E. Pawel	Fracture toughness, tensile prop. TEM	Austenitic and ferritic steels	250-300	3	Dec-91	Feb-92	—
HFR-JP-18	ORNL	JAERI	M.L. Grossbeck/ J.E. Pawel	Fracture toughness, tensile EPR, TEM	Austenitic and ferritic steels	60-125	3	Aug-91	Oct-91	—
HFR-JP-19	ORNL	JAERI	M.L. Grossbeck/ J.E. Pawel	Similar to HFR-JP-18	—	60-125	3	Aug-91	Oct-91	—
HFR-JP-20	ORNL	JAERI	J.E. Pawel	Tensile Prop., TEM, He effects by isotopic tailoring	Austenitic and ferritic steels	300-600	8	Dec-93	Jun-94	—
HFR-JP-21	ORNL	JAERI	J.E. Pawel	Similar to HFR-JP-20	—	—	18	Dec-93	Apr-95	—
HFR-JP-22	ORNL	JAERI	J.E. Pawel	Similar to HFR-JP-20	—	—	34	Dec-93	Jan-96	—
HFR-JP-23	PNL	MONBUSHO	D.S. Gelles	TEM	Austenitic and ferritic steels, Cu, Mo, V alloys, TiAl	300-600	8	Dec-93	Jun-94	—
HFR-MFE-60J	ORNL	JAERI	J.L. Scol/ M.L. Grossbeck	Spectrally tailored for fusion He prod. Began in ORR as ORRMFE-6J (6.9 dpa), TEM, Charpy, irradi. creep, tensile and crack growth prop., —	Austenitic and ferritic steels, and Ni alloys	60	18 (total)	Jul-90	Nov-92	—
HFR-MFE-330J	ORNL	JAERI	J.L. Scol/ M.L. Grossbeck	Began in ORR as ORRMFE-7J (7.4 dpa)	—	—	330	18 (total)	Jul-90	Nov-92
HFR-MFE-200J	ORNL	JAERI	M.L. Grossbeck/ J.E. Pawel	Similar to HFR-MFE-60J. Began in ORR as ORRMFE-6J (6.9 dpa)	—	—	200	18 (total)	Nov-92	Jan-95
HFR-MFE-400J	ORNL	JAERI	M.L. Grossbeck/ J.E. Pawel	Similar to HFR-MFE-60J. Began as ORRMFE-7J (7.4 dpa)	—	—	400	18 (total)	Nov-92	Jan-95
HFR-HTS1,-S7	ORNL	L.L. Snead	—	Thermal conductivity	Various Insulators	—	80-350	0.01-1.0	Jun-95	Aug-95
HFR-HTF Series	ORNL	L.L. Snead	—	Fiber tensile	SC	—	80-800	0.001-1.0	Jan-95	Mar-96

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HFR-TRIST-EF1	ORNL	MONBUSHO/JAERI	S.J. Zinkle	In-situ electrical conductivity	Al2O3	450	3E+25 n/m2	Apr-96	Jun-96	
HFR-MFE-RB-10J	ORNL	JAERI	J.E. Pawel	Tensile, fracture	316LN-1G, J316 Low activation ferritics, V alloys, SiC	200, 300	4	Jan-97	Aug-97	
HFR-MFE-RB-11J	ORNL	MONBUSHO/JAERI	M. L. Grossbeck	Tensile, fracture, TEM	Low activation ferritics, V alloys, SiC	300	5	Jun-96	May-97	
HFR-MFE-RB-12J	ORNL	MONBUSHO/JAERI	M. L. Grossbeck	Tensile, fracture, TEM	Reduced act. and conventional ferritic steels	500	5	Jun-96	May-97	
HFR-CTR-82	ORNL	JAERI	R.L. Klueh	Charpy impact and He effects	Reduced act. and conventional ferritic steels	300, 400	10	Feb-95	Dec-95	
HFR-CTR-83	ORNL	JAERI	R.L. Klueh	Charpy impact and tensile, TEM, He effects	Low activation ferritics intermetallics, SC	300, 400, 500	10	Feb-95	Dec-95	
HFR-JP25	ORNL	JAERI	R.L. Klueh	Tensile, fracture, TEM	Low activation ferritics intermetallics, SC	500-800	10	Jun-97	Sep-98	
HFR-JP27	ORNL	JAERI	L.L. Snead	Fracture, TEM	SC	500-800	10	Oct-97	Jan-98	
HFR-JP28	ORNL	JAERI	L.L. Snead	Fracture, TEM	SC	500-800	10	Sep-97	Mar-98	
HFR-P3-6	ORNL	MONBUSHO	K.R. Thomas	Varying Temperature	TBD	400-600	5	May-97	Apr-98	
High Flux Beam Reactor, Brookhaven National Laboratory										
HFR-ISEC-3	ORNL		L.L. Snead	In-situ electrical	WEego Al2O3	450	1.5	Jul-95	Sep-95	
HFR-V1	ORNL		L.L. Snead	Tensile, fracture	V-4Cr-4Ti	75, 150, 225, 75, 225, 300,	0.5	May-95	Jun-95	
HFR-V2	ORNL		L.L. Snead	Tensile, fracture	V-4Cr-4Ti	375	0.5	Jun-95	Aug-95	
Advanced Test Reactor, Idaho Falls										
ATR-A1	ANL	MONBUSHO	D.L. Smith	Tensile, fracture toughness, TEM, creep	Vanadium alloys	200, 300	5	Dec-95	Apr-96	

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BOR-60 Reactor, RIAR, Dimitrovgrad, Russia										
BOR-60-Fusion-1	ORNL, ANL	RDPPE, RIAR	A.F. Rowcliffe, D.L. Smith	Mechanical and microstructural properties	V alloys	350-380	10	Jul-95	Mar-96	
SM-2 Reactor, RIAR, Dimitrovgrad, Russia										
SM-2.1	ORNL, PNL	RIAR	S.J. Zinkle	Tensile, electrical, microstructural, and creep properties	Cu alloys/SS, Cu/Be	100, 200, 330	1, 5	Dec-93	Feb-94	
SM-2.2	PNL	RIAR	D.J. Edwards	Mechanical behavior of bonded materials	Cu alloys/SS, Cu/Be	120, 300	0.2	Jan-96	Mar-96	
SM-2.3	PNL	RIAR	D.J. Edwards	Mechanical behavior of bonded materials	Cu alloys/SS, Cu/Be	100, 250	0.2	Sep-96	Nov-96	
				Irradiation complete						
				Irradiation in progress						
				Irradiation planned						