Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Coupling Design or Manufacture	1a) Improper coupling hardness caused by deviation of heat treating from specified procedure		If rework occurred during the manufacutring process, the expected life could have been reduced.	A. Verzwyvelt	Examine Bodycote NDT results for couplings	Low	In October of 2009, Bodycote and Hydroaire began Double Tempering Process for 416 SS couplings that are currently installed in P-7C, and P-7B. Heat treatment details are not wholly consistent between certified batches, however hardness testing indicated all parts were sat.
				LPI	Review Hydroaire/Bodycote procedures for deviations from procedure	Medium	rfi-62

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Coupling Design or Manufacture	1b) Improper coupling hardness caused by temperature gradient within furnace during manufacturing process			Yim (LPI)	Look for inconsistent hardness, tensile, and charpy results	0	Coupling #7 had varying hardness across the part, where one end was out of spec, while the other was in spec. Coupling #3 installed in 2011 had min max delta of 5.7. LPI report does not address the typical expected hardness ranges across the part.
Coupling Design or Manufacture	1c) Improper hardness caused by inadequate cooling process			0	See 1	High	see Row 3
Coupling Design or Manufacture	1d) Inadequate hardness specification		low impact toughness values (indicated by the CVN) are seen in the	Yim (LPI)	Independent testing of fracture toughness charpy v notch, tensile testing on 2009, 2011 failed components, and other couplings	High	low impact toughness values (indicated by the CVN) are seen in the couplings that have failed with most CVN

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
			couplings that have failed with most CVN values in the single digits at the temperature range of the service water (refer to Table 3-7).				values in the single digits at the temperature range of the service water (refer to Table 3-7).

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Coupling Design or Manufacture	1e) Crack propagation due to sulfide inclusion and secondary heat treament		Based on tempering curves for the batch of couplings installed in P-7A, P-7B and P-7C (Figure 4-2), the tempering temperatures are in the range to be avoided between 400°C and 580°C (752°F to 1076°F) for 416SS. These tempering temperatures can lead to low toughness and susceptibility of the material to	Yim (LPI)	Microspecimen examination of failed 2011 coupling, unfailed couplings, re-review of 2009 metalurgical report	Low	SEM verifies IGSCC of material

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
			SCC.				
Coupling Design or Manufacture	1f) Stress corrosion cracking initiated by neolube contamination	Neolube is comprised of graphite in alcohol suspension, neither of which can cause SCC in 416 SS		Yim (LPI)	Perform chemical analysis of failed surfaces looking for effects of neolube	High	Neolube is comprised of graphite in alcohol suspension, neither of which can cause SCC in 416 SS

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Coupling Design or Manufacture	2) Improper coupling material	Commonly Used for Pump Shafts and Couplings	Industry OE of IGSCC of 416 SS, Perry Root Cause from 2004, Perry changed to 17-4PH SS. Are there better material options available? IPEC when to Nitronics 50	Yim (LPI)	Based on Material analysis performed by LPI test procedure. Compositional analysis, chemical analysis, and EDX., provide recommendation as to material for coupling	Low	Coupling material is quench hardened and tempered 416 SS. Recommendation is for Nitronic 60.
Stress	3) Overtorque from foreign material	Nothing was observed indicating foreign material causing overtorque	Material that could have caused OT condition, may have fallen or otherwise missed during inspection	Geerlings	Interviews with Maintenance to verify that no evidence of damage to impellers exists	Medium	Boroscope inspection of P-9C Bowl Assembly Results: Nothing was observed indicating foreqin material.
				Yim (LPI)	Evaluated failed coupling for single overload condition	Low	Tensile testing indicates failure mode not of "single overload" type

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Stress	4) Misalignment of shaft	Uneven wear is typically experienced in the Service Water Pumps, and may not be abnormal	Evidence of uneven wear on shaft journals Shafts #4, #5, #6.	Yim (LPI)	Visual Inspection of and TIR on three shafts removed	Medium	PENDING LPI REPORT
				Program Engineering	Review Vibration Data, and effects of Seimic Supports	Low	Available vibration data at the motor does not provide indication of shaft imbalance, sensativity of data to shaft imbalance is poor based on location of data sample
				System Engineering, DeBusscher	review WI for packing adjustment	Low	P-7C has been repacked 3 times since 2009 failure. No issues noted
Stress	4a) Improper packing adjustment/installation result in poor shaft aligment causing failure of coupling	Bronze bearing under packing box maintains shaft alignment through packing box	Wear patterns observed on shafts #4, # 5, #6	Yim (LPI)	Realign shafts and document wear patterns	LCO	PENDING LPI REPORT

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Stress	4b) Improper alignment caused by upper or lower seismic restraint.		Lower seismic restraint is mounted near failed coupling location	Electircal Maintenance	Verify pump movement while out of service, when restraints are loosened	Medium	PENDING LPI REPORT
				Maintenance	Interview divers and maintenance	High	No relative movement observed during installation, no movement of unit required to install seismic restraints
Environmental Effects	5) Stress Corrosion Cracking		Initial reports from LPI indicate that SCC is present and likely cause	Yim (LPI)	Perform Scanning Electron Microscopy (SEM) analysis	N/A	SEM verifies IGSCC of material
Environmental Effects	5a) Changes in Water Chemistry	Same chemical has been used for 10 years, if problematic would not be isolated to P-7C. Annual usage present for no more than 24 hours per year	Clamtrol does possess chlorides	N/A	No actions due input from chemistry indicating that this is not felt to be a contributor	High	N/A

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Environmental Effects	5b) Changes in Water Chemistry		Sodium Hypochlorite possesses chlorine. Present at Service Water Pumps 40 minutes/ day.	Chemistry	Characterize chlorine concentration experienced by service water pumps, prior and post 1R21	High	Chlorination increases chlorides by approximately 0.3 ppm, during the 40 minute period daily
Environmental Effects	5b) Changes in Water Chemistry		Lake Water possesses Chlorides, and is present at all times	Chemistry	Characterize chloride concentrations in Lake Michigan water, annually, seasonally, and over last few years. Temperature, PH,	High	9.72 ppm chlorine noted
				Chemistry	Send sample to LPI of service water, with Temp, PH, and TDO of sample	High	
Environmental Effects	Microbiological induced corrosion	No discussion of MIC in lab report		Yim (LPI)	Perform Chemical analysis of coupling deposits	Low	EDS analysis of fracture surface revealed the presence of corrosive agents (chlorides, oxides and

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
							sulfides), consistent with stress corrosion cracking.
Coupling Design or Manufacture	6) Incorrect clearances in coupling to shaft (threading same?)	Hydroaire states that they have a gage and check these dimensions, P-7C,B,A all have same coupling design. Typical experience with couplings indicates no threading issues during installation	Hydroaire Go/NoGo gage failed NoGo check	Hydroaire	Evalaute coupling and shaft thread clearances and verfiy that threads are in tolerance, for parts in question	0	PENDING LPI REPORT
	6a)			0		Low	
Coupling Design or Manufacture	6b) Threads not concentric with coupling			Yim (LPI)	Evaluate existing condition of threads within coupling	High	PENDING LPI REPORT
	7a)			RCE Team	Provide photos of shaft ends near failed coupling, or shafts if available, looking for evidence of Galling of 2009 failure	High	PENDING LPI REPORT

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Stress	7) Shaft faces not square (perfectly flat) and butted	1-4 shafts from failed pump are square	Evidence of galling between shafts 5 and 6	Yim (LPI)	Derterimne cause of galling of shaft end, and squareness of shaft ends 5 and 6	LCO	Galling on Shaft end determined to occur after failure of coupling, post failure damage
Stress	8) Pump alignment	Packing alignment issues may not be relevant to the presence of packing box bearing	None	Mechanical Maintenance	Repack pump, and check position of stuffing box relative to shaft	LCO	
				Mechanical Maintenance	Sweep stuffing box bore, TIR etc....	Medium	As found shaft to stuffing box, 3 -4 places, 0.002"
				FIN	WR - 246107, compare levelness of head mounting flange to sole plate	0	PENDING LPI REPORT
				0	Check fit, for the following	LCO	
				Mechanical Maintenance	1. Radial clearance fit between column and head	LCO	Chamfered fit such that no clearance exists during installation.
				Mechanical Maintenance	2. Concentricity of stuffing box bearing to upper head register	Medium	

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
				Engineering	When was the head last machined (prior to 2009 failure???)	Medium	Head not machined during 2009 rebuild of P-7C
				Engineering	1. How many times has this pump been repacked, because eccentric shaft position relative to the packing is indicative of head to column assembly	Priority	3 Times since 2009 coupling Failure
				0		0	
				0		0	
				0		0	
Stress	8b) Nonconcentric Spider			Mechanical Maintenance	Disassemble pump, looking for non-concentric spiders	LCO	During disassembly, number columns and spiders/ After disassembly in the shop, measure radial fit between spider and associated column. P-7A had

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
							slop ranging up to 0.004" unlikely to cause misalignment issue due to 0.004 - 0.009 tolerance between shaft journal and rubber sleeve bearing
Stress	8c) Alignment of upper column to pump head and stuffing box			Mechanical Maintenance	Repack pump, and check position of stuffing box relative to shaft	LCO	See reference 40
				0		0	
Stress	11) Shaft Wobble allowed by shaft wear at the packing	Bronze bearing mounted directly below packing box should restrain shaft whip. Initial failure modes analysis gives evidence against fatigue failure, typically expected to be caused by cyclic stresses from shaft alignment issues	Evidence of uneven wear on shaft journals Shafts #4 and #5 and #6	System Engineering	Evaluate packing for continued use in Service Water Pump	Low	A change in the type of packing used in P-7C pump, would not affect the failure mode of the coupling
				System Engineering	Evaluate need for hardened sleeve	Low	The addition of Hardened Sleeve to the P-7C Service Water Pump would not

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
							change the failure mode of the coupling event
				Program Engineering/Maintenance	Install Prox Probes to measure and record shaft movement/vibrations	Medium	PENDING LPI REPORT
				0		0	
				0		0	
				0		0	
Stress	12) Reverse rotation during pump start	QO-14 documents check valve closed, by observing no rotation. P-7A has similar distrubution but no failures	Lack of Anti-Rotation Feature on Pump, 1 Rotation Opposite nominal direction noted during test bump (deadheaded) WI-SWS-M-04 6.14 "Motor Bump and Pump Lift Reset" Cycle	System Engineering	Characterize reverse rotation behavior of P-7C when shut off	HIgh	QO-14 states to check for reverse pump rotation, prior to start, initate DRN to add similar statement to SOP-15, potential exists for rapid pump start after stop will cause excessive stresses to shafts and couplings due to reverse rotation driven by gravity, and starting during

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
			data from 2009-2011 shows 27 start/stop intervals of less than 1.44 minutes in duration				the reverse rotation
Stress	12a) Reverse rotation from check valve leak by	No walkdown evidence of rotation in recent memory		System Engineering	Characterize reverse rotation behavior of P-7C when shut off	High	No evidence of check valve leak by or persistant reverse rotation
Coupling Design or Manufacture	13) Defect(s) in coupling from factory (stress risers - vent hole thru threads, machining of threads, edges, etc))	Cracks do not appear to go through the vent hole.	Cracks are located within 2-3 threads of the venthole vertical location, and appear to grow outward from thre thread roots	Yim (LPI)	Perform ultrasonic testing and destructive testing of parts looking for defects	High	UT testing unable to be performed due to part design. Inspection of coupling failure modes and FEA indicates highest stresses are within a band 1-2 threads of

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
							venthole , but not through vent hole
Coupling Design or Manufacture	13a) Defects caused by machining including the vent hole.	Cracks do not appear to go through the vent hole.		Yim (LPI)	Examine interior of drilled hole, looking for sources of FME	Medium	PENDING LPI REPORT
	13b)			0		0	
	13c)			0		0	
Stress	14) Contact of shaft with dry rubber on startup (coupler stressor, load applied to shaft by dry bearing)	Expected Wear of Rubber bearing in Spider, noted only one coupling deviating from nominal dimension and only by 0.002", and still in spec. In addtion, tenisile testing indicates that this failure was not a single overload type	Observed coating of nitrile on shaft 4 journal	N/A	No Actions, due to lack of wear noted on rubber sleeve bearings	0	Tensile testing indicates failure mode not of "single overload" type

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Stress	15) Operation at critical speed	Operating at Design Speed, longevity of of other pumps indicates not running at critical speed, Vibration testing indicates NO large 1X frequency response		N/A	No Actions, due to Vibration data indicating not operating at critical speed	0	Vibration data does not support this conclusion
Stress	16) Restart of pump shortly after shutoff (e.g RT-8C, P-7C start 26 s after DG bkr closes = OK) applied extra load to pump shaft.	Timing for the event described would be Pump Running, Stopped, then Running over 26-32 seconds. Pump reverse rotation observed for 2-5 seconds	Reverse Rotation Observed 1 rotation over a couple a seconds, 8/11/11	Engineering	Compare reverse rotation time after pump shut off to typical shortest pump restart times	Medium	
				Yim (LPI)	Nondestructive - Ultrasonic Test	High	UT testing unable to be performed due to part design. Inspection of coupling failure modes and FEA indicates highest stresses are within a band 1-2 threads of venthole , but not through vent hole

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
				Yim (LPI)	Destructive - look for micro cracks	High	MT testing of Coupling #7 and #5 indicates cracking present in Coupling 7 due to IGSCC
Stress	17) Dead head start following rebuild and quarterly surveillance test caused coupling damage or bending of shaft	Typical pump response during deadheaded start is to "jump". Shaft coupling failures have not occurred immediately after a start		Yim (LPI)	Stress evaluation of coupling with consideration to shock load	Medium	Lab data indicates failure is not of "single overload event" type, does not support this failure cause
Stress	18) Improper shaft coupling engagement	A before and after measurement in the work order package refutes this		Yim (LPI)	Document wear patterns on journals	Medium	Documentation does not support improper coupling engagment as a cause

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Stress	19) Improper pump lift setpoint	Does not relate to coupling failure, unless Mech Mainteance is stretching the column significantly during lift setting, however, total float is verified and matches design, in addtion, adjustment of float is done by hand, making it very unlikely that significant addtional stresses are created during this process	In work instruction there is a choice of two different settings, this differs from drawings?	System Engineering	Determine basis for the 1/2" and 3/8" pump lift settings in Work Instruction, Possible Source Jim Alderink	Medium	CR-PLP-2011-03967 & RFI 18 associated with P-7C 8/2011 Coupling Failure - Work methods do not support this as a cause for the observed failure
Stress	20) Increase load by backpressure from strainer blockage	P-7A/C has had large organic blockage occur with no recent coupling failure associated		System Engineering, Debuscher	Review ESOMS and characterize strainer DP over time	Low	History shows no association between Strainer backpressure and coupling failure

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Stress	21) Flow charactoristic changes due to sand build up in intake structure	Over 18 months, the sand collection within the service water bay ranges from 0-4", where the low point is near the service water pumps. Sand collection rate is linear over time, with the relative collection of sand in the service water bay significanly reduced compared to the intake structure		System Engineering	Review vibration history over time Document history of sand review from service water bay. Listen for voiding using a stethoscope on discharge pipe	Low	Sand collection in service water bay is minimal, typically 0" depth in flow field of pumps, unlikely cause of coupling failure
Stress	22) Pump assembly changes	Similar procedure for P-7A, and P-7B which have not yet failed.		HydroAire	Review design and dimensional changes due to 2009 rebuilt of pump, Review EC for 2009 rebuild	High	
Stress	23) Component replacements within last 5 years	P-7B, and P-7A have stainless steel couplings and no failures as of yet	P-7C couplings were changed to stainless steel during 2009 rebuild, prior to that	HydroAire	Review design and dimensional changes due to 2009 rebuilt of pump	High	rfi-12

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
			were Carbon Steel, no failures associated with couples observed				
Coupling Design or Manufacture	24) Fatigue failure			Yim (LPI)	Evaluate Failed Coupling for Fatigue Failure	Medium	SEM examination revealed the fracture surface morphology to exhibit a rock-candy appearance, characteristic of intergranular stress corrosion cracking (IGSCC) as shown in Figure 3-10. This is typical for a quench and tempered steel, such as a 400 series martensitic steel.

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Coupling Design or Manufacture	25) Coupling design - Entire coupling threaded vs. relief section in center			Design Engineering	Recommend and prepare Design Change package for Coupling Design Changes	High	rock-candy appearance, characteristic of intergranular stress corrosion
Environmental Effects	26) Corrosion caused by environmental conditions		Perry, Palsades failure all above non-operating water levels within the pump	Yim (LPI)	Perform chemical analysis of failed surfaces looking for environmental causes	High	SEM examination revealed the fracture surface morphology to exhibit a rock-candy appearance, characteristic of intergranular stress corrosion cracking (IGSCC) as shown in Figure 3-10. This is typical for a quench and tempered steel, such as a 400 series martensitic steel.

Attachment II - Failure Mode Analysis

Aspect	Failure Mode (yellow lines cannot be completed within RCE team	Refute	Support	Assigned to	Action Items	Priority	Results
Stress	27) Maintenance - Pump Assembly Practices	P-7A - WI-SWS-M-03, P-7B/C Wi-SWS-M -04 ---------- Coupling Assembly/Disassembly the same	Some Fleet installation practices differ from Palisades Practices	Maintenance	**Fleet Call with other plants that have raw water vertical turbine pumps with treaded couplings. Send out work instruction for maintenance of pump, prior to**	High	Palisades practices found meeting or exceeding fleet standards
Environmental Effects	28) P-7C has different operation cycle from P-7B, P-7A, results	Similar metals, chemical environment, pump design	P-7C has failed 2 couplings, P-7B and P-7A have not	System Engineering, Aaron Verzywvelt	Compare run time, idle time, average operating interval periods for Service Water Pumps	High	P-7A and P-7C have similar operating cycle, P-7B has had different cycle due to saving the pump during early 2010 due to degraded performance

Attachment III – Safety Culture Evaluation

TA TABLE 1 – SAFETY CULTURE COMPARISON

SAFETY CULTURE COMPONENT	DESCRIPTION	CR-PLP-2011-03902
1. Decision-Making	Licensee decisions demonstrate that nuclear safety is an overriding priority:	RC_1 - No indication RC_2 - No indication CC_1 - No indication CC_2 - No indication CC_3 - No indication
2. Resources	The licensee ensures that personnel, equipment, procedures, and other resources are available and adequate to assure nuclear safety.	RC_1 - No indication RC_2 - Yes CC_1 - No indication CC_2 - Yes, significant CC_3 - No indication
3. Work Control	The licensee plans and coordinates work activities, consistent with nuclear safety:	RC_1 - No indication RC_2 - No indication CC_1 - No indication CC_2 - No indication CC_3 - No indication
4. Work Practices	Personnel work practices support human performance.	RC_1 - No indication RC_2 - No indication CC_1 - No indication CC_2 - No indication CC_3 - No indication
5. Corrective Action Program	The licensee ensures that issues potentially impacting nuclear safety are promptly identified, fully evaluated, and that actions are taken to address safety issues in a timely manner, commensurate with their significance.	RC_1 - No indication RC_2 - No indication CC_1 - No indication CC_2 - No indication CC_3 - Yes, not significant
6. Operating experience	The licensee uses operating experience (OE) information, including vendor recommendations and internally generated lessons learned, to support plant safety.	RC_1 - No indication RC_2 - No indication CC_1 - No indication CC_2 - No indication CC_3 – Yes, significant
7. Self- and Independent Assessments	The licensee conducts self- and independent assessments of their activities and practices, as appropriate, to assess performance and identify areas for improvement.	RC_1 - No indication RC_2 - No indication CC_1 - No indication

Attachment III – Safety Culture Evaluation

SAFETY CULTURE COMPONENT	DESCRIPTION	CR-PLP-2011-03902
		CC_2 - No indication CC_3 - No indication
8. Environment For Raising Concerns	An environment exists in which employees feel free to raise concerns both to their management and/or the NRC without fear of retaliation and employees are encouraged to raise such concerns.	RC_1 - No indication RC_2 - No indication CC_1 - No indication CC_2 - No indication CC_3 - No indication
9. Preventing, Detecting, and Mitigating Perceptions of Retaliation	A policy for prohibiting harassment and retaliation for raising nuclear safety concerns exists and is consistently enforced.	RC_1 - No indication RC_2 - No indication CC_1 - No indication CC_2 - No indication CC_3 - No indication
10. Accountability	Management defines the line of authority and responsibility for nuclear safety.	RC_1 - No indication RC_2 - Yes CC_1 - No indication CC_2 - No indication CC_3 - No indication
11. Continuous learning environment	The licensee ensures that a learning environment exists.	RC_1 - No indication RC_2 - No indication CC_1 - No indication CC_2 - No indication CC_3 - No indication
12. Organizational change management	Management uses a systematic process for planning, coordinating, and evaluating the safety impacts of decisions related to major changes in organizational structures and functions, leadership, policies, programs, procedures, and resources. Management effectively communicates such changes to affected personnel.	RC_1 - No indication RC_2 - No indication CC_1 - No indication CC_2 - No indication CC_3 - No indication
13. Safety policies	Safety policies and related training establish and reinforce that nuclear safety is an overriding priority in that:	RC_1 - No indication RC_2 - No indication CC_1 - No indication CC_2 - No indication CC_3 - No indication