	Construction Plant-hire Association Tower Crane Interest Group	
	Tower Crane Technical Information Note	
TIN 024	**Luffing Jib Tower Cranes - Precautions For Users**	

The HSE investigation into the collapse of a luffing jib tower crane at a housing project in Liverpool in January 2007, has highlighted a number of issues with lifting light loads at minimum radius and in wind speeds approaching the luffing jib tower crane manufacturer's limiting values.

The likely sequence of events leading to the collapse of the crane was as follows:-

- Immediately before the collapse, the crane was lifting a light load with its jib almost vertical, whilst at the same time a gust of wind, at or above the safe in-service limit of the crane, lifted the jib momentarily.
- This was sufficient to release tension in the luffing rope which then came off the sheaves in the reeving system and jammed. The driver then tried to lower the jib, however, because the luffing rope was jammed, slack rope paid out from the luffing rope winch drum and formed a loop at the back of the counter jib.
- The luffing rope jam subsequently became free and the jib went in to free fall, until it took up all the slack in the rope. At this point a massive shock load was imparted to the crane structure via the luffing rope.
- This caused the jib to bend, the bolts holding the main crane assembly to the top of the crane tower (via the slewing ring) to fail and the slewing ring to fracture. The crane assembly then toppled from the tower landing upside down on the building below (the concrete counterweights falling out in the process, one of which killed a joiner working in the building below).

The purpose of this TIN is to draw the following points to the attention of all users of luffing jib tower cranes, including Principal Contractors and those responsible for the planning and managing of lifts:-

1. Particular care should be taken when planning lifts which require the lifting of light loads at or near the minimum radius of a luffing jib tower crane;
2. The luffing rope should be under tension at all times. When lifting very light loads it may be appropriate to add additional "dead" weight to the hook block or load. This should be undertaken in consultation with the crane supplier;
3. Particular care should be taken when operating in gusty wind conditions, taking into account the specific characteristics of the site (See **TIN 020** *The Effect of Wind on Tower Cranes in Service* for additional information);
4. Before the start of each shift the operator should ensure that the anemometer is functioning;
5. Steps should be taken to ensure that any safety devices fitted to the crane are functioning properly. This will normally be accomplished by consultation with the crane supplier;
6. The competence and experience of the Appointed Person should be verified to ensure that they are able to manage lifting operations involving luffing cranes effectively;
7. Luffing jib tower crane operators should be asked if they are aware of the measures they should take in the event of a luffing jib being "held up" by wind. **TIN 025** gives guidance on the measures to be taken.