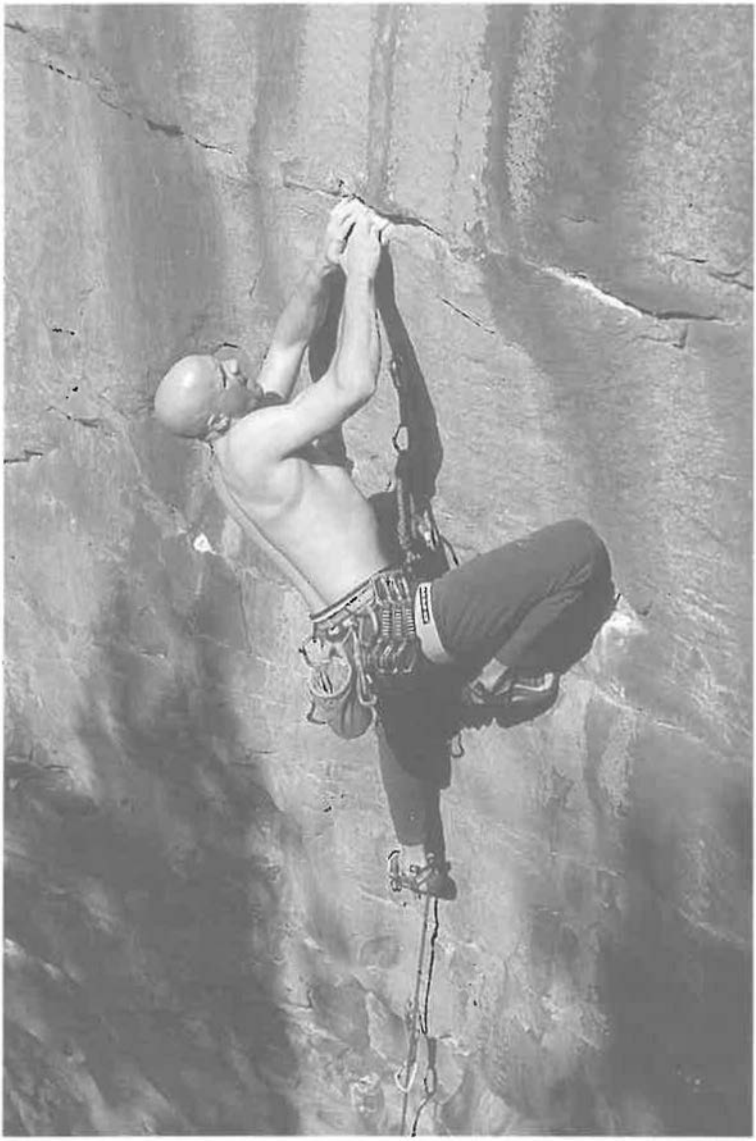
CHAPTER EIGHT

SRENE Anchors

SRENE is an acronym for Solid, Redundant, Equalized, and No Extension first connived by professional guide Marc Chauvin, for use when teaching clients anchoring fundamentals. Marc's first acronym was RENE. S (Solid) was later added, resulting in SRENE, which was appropriated by the IFMGA (International Federation of Mountain Guides Association), and later by me in the first anchor book.

Since its inception SRENE has for many climbers become a sort of fixed-in-stone checklist to which every anchor must conform. This is not only a perversion of the original intention of SRENE, it is physically impossible when SRENE qualities are sought in absolute literal terms. But that hasn't kept people from trying, which over the last decade has spawned a breaking wave of commentary based on everything from Newtonian physics to blue wind. Those favoring this or that aspect of SRENE have squared off like Sumo wrestlers, charging each other with the passion of True Defenders of the Faith. But like everyone married to doctrine, they find themselves yarding on crumbly holds because when considered as inflexible doctrine, SRENE embraces mutually exclusive qualities. For instance, with hand-placed gear you can rarely if ever achieve simultaneous non-extension and equalization. And in the real world, redundancy is not always possible—though always desirable. Mountaineer and engineer Craig Connally, in *The Mountaineering Handbook*, puts it this way: "If static equalization invariably boils down to redundancy rather than true equalization, and dynamic equalization doesn't lead to true shock loading, the old acronyms [SRENE] leave us adrift. What then is a reasonable, realistic approach to building anchors?"

The only "reasonable and realistic" approach to building anchors is to leave off considering SRENE as an absolute doctrine or checklist, and to use SRENE for the purpose for which it was originally devised: as an anchor evaluation methodology. If you were to make a list of traits you'd like in a mate, and settled for nothing less



Keith McAllister on *Tongulation,* New River Gorge, West Virginia. PHOTO BY STEWART M. GREEN.

than someone who perfectly embodied those traits, you'd remain single for as long as you lived. Same goes for building anchors according to SRENE. Most every anchor is a trade-off according to what is actually required, and because every aspect of SRENE is rarely necessary in any anchor—and you're not going to perfectly achieve them all in any event—SRENE is useful only as an evaluation technology. And to that end, SRENE is the best thing going.

All this might sound overly technical and complicated, but in fact all of these concepts are based on common sense and elementary mechanical laws that are usually self-evident once you gain experience. Still, let us look closer at the fundamental concepts behind SRENE. Kindly settle in for the duration.

Solid means just that. The individual, primary anchors and the system as a whole must be bombproof, able to stop a rogue elephant, without question.

Redundant generally means placing three or four solid anchors (more if the anchors are less than ideal). Never use only one nut. Never. Most experienced climbers don't consider an anchor secure until they have set a minimum of three secure primary placements. Two bombproof anchors is the absolute minimum, and only is acceptable when more are not to be had. In emergencies climbers occasionally will use a single bolt, tree or tied-off boulder for an anchor, but secure backup anchors will greatly reduce the chance of a catastrophe. Likewise, because SRENE is an evaluation technology covering the anchor as a system, elements within the system (biners, slings, etc.) should be backed up. Redundancy also can include setting anchors in more than one crack system, to avoid relying on a single rock feature.

Equalized refers to distributing, as equally as possible, any potential loading to the various primary anchors in the system. The aim is to increase the overall strength of the system and to reduce the chance of a single anchor pulling out under loading. Perfect equalization, or even nearly perfect equalization, is something never fully achieved. A reasonably *distributed* load is more often than not all we actually need. This concept will be revisited in the next chapter during our discussion of rigging methods such as the sliding X and cordelette.

No Extension means that if one of the anchors in the system should fail, the system will not suddenly become slack and drop the climber a short distance, loading the remaining anchors. Recent studies suggest that short extensions in loading are not nearly as severe or dangerous as first thought. Like equalization, this is a concept best covered in our discussion of rigging methods in the next chapter.

While SRENE is what we try to achieve, whenever humanly possible, when building anchors, **simplicity** and **efficiency** are the bywords of how we go about our task.

Simplicity means we strive to keep the anchor basic and streamlined, exploiting the obvious features with the simplest, most obvious primary placements, and using elementary, as opposed to garish, rigging techniques whenever possible. We don't

SRENE Anchors

- Solid
- Redundant
- Equalized
- No Extension

want the anchor equivalent of the Taj Mahal. We want Fort Knox. As we all know, it is usually easier to judge the value of a simple system as opposed to a complicated one, and with every anchor, we're wagering our lives on our judgment that the anchor is "good enough." Keep it simple and live to a great age.

Efficiency means we aim to fashion anchors that are swift to build and easy to clean. To do so we need to be organized and effective in our use of time and equipment. Always searching for the quickest and simplest method, we decide on a strategy and apply it to achieve one basic goal—to build anchors that are "good enough." On long trad routes, we arrive at belays at the end of a lead, when we have the least amount of gear with which to build an anchor, so the need for us to work efficiently cannot be overstated. Sure, we all have an ideal anchor we are striving to build, but more times than not we're left to deal with what we've got, and what we've got is seldom ideal.

SRENE VARIATIONS

Several versions of the SRENE acronym have surfaced over the last decade, including SERENE, ERNEST, NERDSS, DORK, SKUNK, SANE and several others. Each acronym contains the same basic principles (which are typically renamed to fit the acronym), with some mixing what we build (SRENE) with how we build it (simply and efficiently). There's nothing wrong with these acronyms, but there does remain a community-wide need to standardize this basic evaluation technology in the same sense that there is a need to have one name, not ten names, for piton. It is neither simple nor efficient to keep cooking up different acronyms to package the self-same principles. So SRENE it is.

REDUNDANCY: THE ONGOING DISCUSSION

Redundancy, as a valuable quality in anchors, became widely standardized shortly after the first edition of *Climbing Anchors*. Since then the subject has drawn a hailstorm of arguments and counter-arguments about A) what redundancy actually is, and B) the relationship of redundancy and security. Some argue that redundancy and security are synonymous, that one is impossible without the other. This is passionately denied by others, though no one questions the overall importance of redundancy. Since you'll encounter this subject time and again, both in print and in the field, let's review the basic debate.

All anchors consist of various links of primary placements and rigging, and the strength and security of those links will always vary within one anchor matrix. To counter this, we bolster the multiple links within the anchor system through redundancy. Basically, redundancy demands that anchor systems be constructed of multiple components—from the primary placements, to the slings and biners we use in rigging the placements together—so that if any one component fails, the anchor will not fail. In other words a redundant anchor never stakes our life on one piece of gear. Yet in several instances we do just that. We (almost always) climb on one rope, tied into one harness, with one belay/rappel loop, on which—when needed—we use one locking biner connected to one belay device.

This hurls us onto a slippery slope. We can't trot out redundancy as an inviolate rule, and break it at the same time. The question becomes this: Can security only be achieved through redundancy? If so, why do we climb on one rope, one harness, etc. If not, where does this leave us in terms of anchors?

Simply put, a fail-safe anchor, not redundancy per se, is the ultimate goal, and redundancy is only one important tool to achieve that goal. Stated differently, we build fail-safe anchors not to ply a rule (redundancy), but so we don't die. If redundancy helps us build fail-safe anchors, as it almost always does, then we use it whenever possible. But experience will eventually show us that a viable anchor can be achieved, however rarely, without letter-perfect redundancy. Furthermore, in the real world there are places where even the most experienced climbers cannot make redundant every facet of the system, and to claim and insist that you can, and must, is false and misleading.

CLIFF NOTES ON REDUNDANCY

- Redundancy Credo: *Never trust a single piece of gear.*
- Proper redundancy ensures that if any one component fails, the anchor will not automatically fail.
- Redundancy asks that anchor systems be constructed of multiple components—from the primary placements, to the slings and biners used for connecting placements.
- According to NASA, *doubling-up (making redundant) components within any system greatly increases their reliability* (over single component setups). Tripling slightly increases reliability over doubled setups. Quadrupling makes practically no difference.
- In real world climbing you sometimes cannot make redundant every facet of the system, but there is every reason to try.
- A fail-safe anchor, not redundancy per se, is the ultimate goal, and redundancy is only one important tool to achieve that goal.

In studying ideal ways to build anchors, here and in a hundred other sources, climbers are sometimes led to believe the rock will always accommodate a textbook setup. It won't, a fact that an overwhelming number of readers demanded I point out. Every experienced climber has on occasion wandered off-route and onto terrain where they were forced to arrange anchors with no redundancy whatsoever. It would be a betrayal to imply this can never happen, that all of your anchors can be perfect.

Nevertheless, piss-poor anchors are for most climbers an infrequent experience. By and large there are adequate anchors to be had, and when there are, it all boils down to this: On the cliffside, we cannot attach machinery to our anchors and objectively quantify their strength. In most cases we must trust our ability to assess the probability of failure. On one hand we're talking about a personal judgment rooted in one's level of acceptable risk, and one's ability to accurately assess that risk. If your level of acceptable risk is zero (a ratio never realized in the climbing game), then you'll try and take redundancy, and every aspect of SRENE, further than you need to go, and any anchor short of ten bolts will be a deal breaker. Celebrated American climber Curt Shannon puts it this way: "Boeing 747 aircraft do not have two left wings in spite of the fact that if the single, non-redundant left wing comes off, everyone on board will die. Same thing with the use of a single rope. The point being that it is possible to design an element of a mechanism (such as a wing, or a rope) to a standard of quality where a lack of redundancy is a moot issue."

A succinct assessment, but we'd be traversing off early if we left it at that. The fact is, a climbing rope, a harness, a bar-tacked belay loop, a locking biner and the other nonredundant items we all trust—every one is expertly designed, factory made, subject to rigorous quality control and tested by everyone with a clipboard and too many pens in their vest. These nonredundant items are basically the climbing equivalent of the airplane wing, with a fail probability so small that, as Curt pointed out, their redundancy is a moot point.

Climbing anchors, on the other hand, are routinely fashioned in junk rock by people who little understand the gear or rigging techniques and have no experience in judging critical issues like direction of loading and fall factors. To help compensate for these variables, we foster a mindset and tender a criteria (redundancy) suggesting that you double up whatever you can, whenever you can. Period. We climb on one rope and with one harness; we belay off one tree when the tree is healthy and 10 feet wide; and hating every second of it, we sometimes ARE forced into belaying off one nut. But redundancy is one of our stated goals with all anchors. As one climber put it during an Internet discussion: "The purpose behind redundancy is to save your ass when your assumptions are wrong." Another climber added: "Always keep more than one failure point between you and the reaper. This way you have to screw up twice at the same time to kill yourself." I trust the picture is clear.

That much said, does redundancy only imply that we should double up every nut in the system? Actually it's a little more involved. To understand how anchors actually work, you must learn to consider the anchor beyond it's component parts and appreciate it as a whole, as a mechanical system. In this sense redundancy becomes a much broader concern.

Redundancy asks one basic question: Can any one component of the anchor fail that in turn will cause the whole anchor to fail? Initially most people consider redundancy in terms of primary placements. That is, if there are two or more pieces, then an anchor is redundant, right? Not exactly. SRENE is an evaluation criteria covering the entire anchor system. Two good bolts are redundant, but what if we connect them with one sling? If the sling blows, we're goners. So two bolts connected with one sling is not redundant in terms of the system.

Barring huge trees and colossal blocks, the photos in the next chapter illustrate that all acceptable anchors consist of at least two primary anchors, or two groupings of primary anchors, which could also be called the "legs" of an anchor setup. Redundancy in an anchor normally requires that each of the two primary anchors, or legs, be strong enough to sustain worst-case scenario loading. If one or both of the legs are not strong enough for such loading, then we go after equalization/distribution within a leg, as well as between the legs. By way of overhand knots and clove hitches we sometimes make redundant the arms of the slings clipped to single or multiple primary placements. The photos and commentary demonstrate these points. For now it's instructional to understand what NASA discovered in a study of redundant systems:

A. Assume that one leg of your anchor has a failure potential of one in a thousand.

B. It follows that two equal legs would have a failure rate of one in a million (1,000 x 1,000).

C. Three legs would slightly increase the reliability.

D. Four and up make practically no difference.

The bottom line is clear: Even when the individual components of an anchor have a failure rate of one in a thousand, by simply doubling them up you increase the security by a thousand-fold. This alone is a decisive vote for doubling up and making redundant every component within an anchor matrix.

A last redundancy concern is the maxim that you should never place all of your primary placements in the same feature—be it in one section of crack, behind one flake, etc. For better or worse, this maxim can never be realized across the slab. Many times you have no choice but to arrange an anchor in one crack, especially in granite areas like Yosemite. Nevertheless, for several reasons, the maxim is valid as a basic principle.

In areas of suspect rock, aim to spread the primary placements over a few different features, in case one feature should fail. Know that it's exceptionally rare that a fall will dislodge an entire feature. More commonly, a fall will shear away the rock around where a nut or cam is seated, as opposed to blowing out a section of crack or ripping a whole flake off the wall—though both have happened. Another reason to spread the anchor out is that it is difficult to arrange an acceptably equalized, omnidirectional belay from primary placements arranged solely in a straight up and down crack.

Can you, or must you, achieve redundancy in every situation on the cliffside? No. But as a rule of thumb, redundancy is at the top of the list. Bear this in mind when reviewing the photos, where the theory of redundancy is applied in dozens of ways.